APPENDIX V

Engineering Calculations and Cost Estimates for Remedial Alternatives

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TABLES

APPENDIX V
ENGINEERING CALCULATIONS AND COST ESTIMATES FOR REMEDIAL ALTERNATIVES

This appendix presents the physical dimensions and cost estimate calculations for all remedial alternatives established by the feasibility study (FS).

ENGINEERING CALCULATIONS

Surface areas and material volumes were calculated for each site containing impacted environmental media. Areas were calculated from digital topographic base maps using geographical information system mapping software by delineating the polyginal region on the maps.

For the unexploded ordnance (UXO) sites, the extents of UXO impact were determined by on-site surveys. Where possible, a test lane was surveyed to locate and identify ordnance on each site for purposes of estimating the total number of UXO items across the site. The total quantity of UXO items at each site was determined by assuming that the density of ordnance in the test lane is the same as the entire site. Results of the surveys are presented below.

- SWMU 1 was determined to include a total area of approximately 890 acres. The actual test lane surveyed to identify UXO items was 10 feet wide and 6,500 feet long, or 1.5 acres in size. The survey identified two ordnance items within the test lane for a density of 1.3 UXO items per acre. As a result, a total of 1,187 UXO items are potentially present throughout the site.

- SWMU 2 was determined to include a total area of approximately 45 acres. A test lane was not constructed across the site because of hazards associated with land mines in rugged terrain. Since this area is a minefield, the density of items is likely high, which translates to high potential risk for clearance efforts.

- SWMU 8 was determined to include a total area of approximately 25 acres. The site comprises a landfill, a beach fortification area, and the beach front. Only the landfill was fully surveyed since the other two areas contain personnel hazards.

The actual test lane surveyed to identify UXO items encompassed the entire surface of the landfill and adjacent areas, which is approximately 5 acres in size. The survey identified 82 ordnance items on the surface and an additional 52 items in the subsurface following detonation of the surface items. This indicates that a large quantity of UXO items potentially exists at this site. However, no specific estimate can be made without further excavation given the high density of ordnance.

- SA 93 was determined to include a total area of approximately 380 acres. The actual test lane surveyed to identify UXO items was 10 feet wide and 2,200 feet long with an additional 0.25 acre surveyed in a spoked wheel pattern for a total of 0.75 acre. The survey identified six ordnance items within the test lane for a density of eight UXO items per acre. As a result, a total of 3,040 UXO items are potentially present throughout the site.

For landfills, the extent of impacted environmental media was determined by on-site field measurements made in test pits and boreholes. From these locations, both the areal extent of the landfill and the depth of landfill contents were determined. The volumes of impacted environmental media in the landfill areas were based on the chemical concentrations at these locations. Survey results for each of the landfills are presented below.

- SWMU 2 was determined to include a total area of approximately 4.5 acres. However, some monitoring locations did not contain chemical concentrations sufficient to adversely impact the soil. As a result, the extent of impacted soils was estimated based on distance from locations for which a total of 3.6 acres was determined to be impacted. An estimated depth of 8 feet was then used to determine the volume of impacted soils.

- SWMU 4 was determined to include a total area of approximately 3.8 acres. Based on aerial photographs and the position of the access road, the entire portion of the site north of the road was included in the area estimate. Volume of the impacted soils was based on the depth of the landfill, which is 8 feet.

- SWMU 29 was determined to include a total area of approximately 5.8 acres. The entire area was assumed to contain impacted soil at a depth of 10 feet based on chemical concentrations at the sampling locations.

For sites other than UXO sites and landfills, the survey results are presented below for both areas and volumes of impacted environmental media.

- SWMU 17 was determined to contain impacted environmental media in several areas. The extent of surface water is approximately 0.6 acre with an estimated volume of 235,000 gallons. However, this volume is variable due to weather conditions and surface water runoff. Areas and depths of chemicals in soil and sediment are based on chemical concentrations from boreholes and excavations established during various field investigations. Only areas perennially covered with water were considered to contain sediment, which include the former waste oil pit, retention pond, and Yakutat Creek. The overall surface area of the sediments was determined to be 1.1 acres at a depth of 1 foot. Impacted soil and areas containing surface soil that are seasonally covered with water such as the roadside ditches and depressed areas that hold water for a prolonged period were determined to be 1.4 acres at a depth of 3 feet.

- SWMU 10 product/waste storage area was determined to contain impacted soils within the site boundary of 2.4 acres. Since only a portion of the soil is impacted, field sampling and analysis will need to be conducted to relocate the impacted areas.

- SWMU 20 drum disposal area was determined to contain approximately 10 cubic yards of impacted sediments in a specific area in the Trout Creek floodplain. The impacted sediments are just below ground surface at 0.5 to 1.5 feet in a small area originally occupied by drums. This is an estimate since the area will require confirmation sampling following the previous interim removal action.

- SWMU 27 drum disposal area was determined to contain impacted sediments encompassing the entirety of the lake at approximately 0.2 acre and a depth of 1 foot. This is an estimate since the sediments have not been characterized throughout the lake.

- South Sweeper Creek was determined to contain impacted sediments in the reach that parallels the runway for about 2,000 feet above the Bayshore Highway bridge. This area encompasses approximately 4.5 acres with a depth of 1 foot.

- Sweeper Cove was determined to contain approximately 450 acres of sediments within the area enclosed by the harbor jetty. Impacts of the chemicals within the

cove appear to be ubiquitously distributed with no clearly defined "hotspots." Areas of higher chemical concentrations are considered likely to be redistributed over time due to tides and currents. Thus, for estimation purposes, the depth of impacted sediments throughout the cove was assumed to be 1 foot.

COST ESTIMATES FOR REMEDIAL ALTERNATIVES

As defined and discussed in technical guidance (U.S. EPA 1987), cost estimates provide the total resource costs over time associated with each remedial alternative. The development of cost estimates involved both estimates of capital and operation and maintenance (O&M) costs, and a present worth analysis of annual costs for each alternative. Activities associated with capital costs typically involve work that is limited in duration, causes chemical levels to be reduced a measurable amount, and yields significant protection to human health and the environment. Similarly, activities associated with O&M costs typically involve work required to maintain the effectiveness following completion of the remedial action, to stop or control continued chemical migration, and to extend over a specified period of time.

Capital costs consist of both direct and indirect costs. Direct capital costs are those related to the installation of the remedial action, as follows:

- Remedial action construction
- Equipment and materials
- Land and site development
- Buildings and related services
- Disposal of waste materials
- Relocation of facilities and population

Indirect capital costs are those related to necessary services that are not a part of the actual installation of the remedial action, as follows:

- Engineering
- Financial and legal
- Supervision
- Design and development
- Monitoring and testing
- Contingency allowances

- System start-up and debugging
- Licenses and permitting
- Other services

O&M costs are those related to post-construction and installation activities necessary to ensure continued effectiveness of a remedial action, as follows:

- Operating labor (by skill category)
- Maintenance (materials and labor)
- Auxiliary materials and energy
- Services (professional and vendor)
- Administrative
- Insurance, taxes, and licenses
- Contingency costs
- Other costs

The primary area of uncertainty in developing unit costs for remedial alternatives at NAF Adak is the availability of existing infrastructure, including utilities, housing, equipment, personnel, and structures. Based on current schedules for closure according to Base Closure and Realignment Act (BRAC), the Navy intends to evacuate Adak Island by the end of 1997. Hence, for all remedial action alternatives, it is assumed that all work will be performed in a remote environment with little to no infrastructure support from the Navy. Because the accuracy of an FS cost estimate is intended to be in the -30 to +50 percent range, only those major cost elements expected to significantly affect the overall level of accuracy are addressed. The primary cost elements that affect the accuracy of cost estimates are identified below.

- **Utilities** include potable water, sanitary sewer system, wastewater treatment (for both sanitary waste and [potentially] treatment for chemical contaminants), electrical service, and motor vehicle fuel.

- **Housing** and food will be major cost components, depending on availability and the cost of maintaining existing housing facilities.

- **Equipment** availability will significantly affect mobilization costs, depending on what equipment is already on the island. This may include drill rigs, earthwork equipment, trucks, a pug mill, a rock crusher, generators, pumps, tools, spare parts, etc.

- **Personnel** present on island and available for support roles may significantly affect costs. Key positions may include cooks, mechanics, equipment operators, and contractors. Support personnel will have to be mobilized and stationed on the island if they are not already available.

- **Structures** potentially available for use in treatment alternatives may significantly reduce costs. Existing storage tanks, hangars, offices, or concrete pads could be used if available.

Once the status of these infrastructure components is known, appropriate unit costs can be developed. A fairly comprehensive list of available infrastructure, along with any associated costs to the Navy of providing such infrastructure, would need to be quantified for the preferred alternative.

Table V-1 presents a summary of costs for remedial alternatives presented in this appendix. Tables V-2 through V-31 provide detailed costs for alternatives previously developed and evaluated for non UXO sites. These tables are organized into the same cost categories and cost elements presented above. Table V-32 shows the various cost elements considered for remedial alternatives in support of the detailed cost tables. To relate the detailed costs for alternatives to the individual cost elements, Table V-33 lists the assumptions established for the remedial alternatives by site type and assumption category used in the development of costs. Finally, Tables V-34 through V-48 provide detailed costs for alternatives associated with various types of UXO clearance.

REFERENCES

U.S. Environmental Protection Agency (U.S. EPA). 1987. *Remedial Action Costing Procedures Manual.* EPA/600/8-87/049. October 1987.

Table V-1
Summary of Costs by Remedial Alternative

Remedial Alternative	Capital ($)	Annual O&M ($)	Total Present Worth Cost ($)
Alternative 1 - No Action			
All FS Sites	0	0	0
Alternative 2 - Institutional Controls			
SWMU 2 (LF)	14,000	37,000	327,000
SWMU 4 (LF)	14,000	37,000	328,000
SWMU 29 (LF)	14,000	45,000	389,000
SWMU 10 (P/W)	12,000	21,000	186,000
SWMU 17 (P/W)	12,000	39,000	339,000
SWMU 20 (DDA)	0	26,000	222,000
SWMU 27 (DDA)	0	23,000	191,000
Sweeper Cove (RWB)	22,400	25,000	246,000
South Sweeper Creek (RWB)	16,200	18,000	253,000
Kuluk Bay (RWB)	22,000	26,000	244,000
Alternative 3 - Containment			
SWMU 2 (LF)	163,000	37,000	475,000
SWMU 4 (LF)	152,000	37,000	466,000
SWMU 29 (LF)	249,000	44,000	624,000
SWMU 10 (P/W)	400,000	21,000	574,000
SWMU 17 (P/W)	305,000	138,000	1,470,000
SWMU 27 (DDA)	180,000	23,000	371,000
Sweeper Cove (RWB)	19,885,000	25,000	20,100,000
South Sweeper Creek (RWB)	647,000	28,000	884,000
Alternative 4 - Removal:			
SWMU 10 (P/W) - Option 1	1,095,000	0	1,095,000
SWMU 10 (P/W) - Option 2	1,166,000	0	1,166,000
SWMU 17 (P/W) - Option 1	4,701,000	138,000	5,866,000
SWMU 17 (P/W) - Option 2	3,770,000	138,000	4,936,000
SWMU 20 (DDA) - Option 1	110,000	0	110,000
SWMU 20 (DDA) - Option 2	110,000	0	110,000
SWMU 27 (DDA) - Option 1	284,000	0	284,000
SWMU 27 (DDA) - Option 2	291,000	0	291,000
Sweeper Cove (RWB) - Option 1	24,312,000	25,000	24,526,000
Sweeper Cove (RWB) - Option 2	313,623,000	25,000	313,836,000
South Sweeper Creek (RWB) - Option 1	810,000	28,000	1,047,000
South Sweeper Creek (RWB) - Option 2	6,698,000	28,000	6,935,000

NOTES:

All FS Sites	All FS Sites: SWMUs 2,4,10,17,20, 27,29, Sweeper Cove, Sweeper Creek, and Kuluk Bay
LF	Landfill Areas: SWMUs 2, 4, and 29
P/W	Product Waste Storage Areas: SWMUs 10 and 17
DDA	Drum Disposal Areas: SWMUs 20 and 27
RWB	Receiving Water Bodies: Sweeper Cove, South Sweeper Creek, Kuluk Bay
O & M	Operation and maintenance costs distributed annually for years 0 to 5, and every 5 years for years 6 to 30
Option 1	Removal and Disposal
Option 2	Removal and Treatment

Table V-2
Alternative 2 - Institutional Controls
for Causeway Landfill (SWMU 2)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install 3 Monitoring Wells	Each	3	2,314	6,942	CM
Total Direct Capital Costs				6,942	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions (No Excavation Without Approvals/ Notifications)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency (20% Direct and Indirect Capital Costs)				2,388	
Total Indirect Capital Costs				7,388	
TOTAL CAPITAL COSTS				14,330	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Groundwater at 3 Wells and Sediment at 1 Location	Event	1	9,462	9,462	EE
Landfill Monitoring Report	Event	1	4,160	4,160	EE
Inspection and repair of landfill cover& maintain vegetation	Acre	3.6	2,274	8,188	EE
Landfill Inspection/Repair Report	Event	1	4,160	4,160	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,152	11,152	EE
Annual O&M Costs				37,122	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				160,738	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				99,858	
Contingency (20% of O&M Costs)				52,119	
TOTAL O&M PRESENT WORTH COSTS (30 years)				312,716	
TOTAL PRESENT WORTH COSTS				327,046	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-3
Alternative 2 - Institutional Controls
for South Davis Road Landfill (SWMU 4)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install 3 Monitoring Wells	Each	3	2,314	6,942	CM
Total Direct Capital Costs				6,942	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions (No Excavation Without Approvals/ Notifications)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency (20% Direct and Indirect Capital Costs)				2,388	
Total Indirect Capital Costs				7,388	
TOTAL CAPITAL COSTS				14,330	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Groundwater at 3 Wells and Sediment at 1 Location	Event	1	9,462	9,462	EE
Landfill Monitoring Report	Event	1	4,160	4,160	EE
Inspection and repair of landfill cover & maintain vegetation	Acre	3.8	2,189	8,320	EE
Landfill Inspection/Repair Report	Event	1	4,160	4,160	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,152	11,152	EE
Annual O&M Costs				37,254	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				161,310	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				100,213	
Contingency (20% of O&M Costs)				52,305	
TOTAL O&M PRESENT WORTH COSTS (30 years)				313,828	
TOTAL PRESENT WORTH COSTS				328,158	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-4
Alternative 2 - Institutional Controls
for Finger Bay Landfill (SWMU 29)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install 3 Monitoring Wells	Each	3	2,314	6,942	CM
Total Direct Capital Costs				6,942	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions (No Excavation Without Approvals/ Notifications)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency (20% Direct and Indirect Capital Costs)				2,388	
Total Indirect Capital Costs				7,388	
TOTAL CAPITAL COSTS				14,330	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Groundwater at 3 Wells and Sediment at 1 Location	Event	1	9,462	9,462	EE
Landfill Monitoring Report	Event	1	4,160	4,160	EE
Inspection and repair of landfill cover& maintain vegetation	Acre	5.8	1,697	9,840	EE
Landfill Inspection/Repair Report	Event	1	9,840	9,840	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,152	11,152	EE
Annual O&M Costs				44,454	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				192,486	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				119,581	
Contingency (20% of O&M Costs)				62,413	
TOTAL O&M PRESENT WORTH COSTS (30 years)				374,480	
TOTAL PRESENT WORTH COSTS				388,811	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-5
Alternative 2 - Institutional Controls
for Old Baler Building (SWMU 10)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Total Direct Capital Costs				0	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions (Industrial Site Use Only)	Site	1	5,000	5,000	EE
Apply landuse restrictions (No Excavation Without Approvals/ Notifications)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				10,000	
Contingency (20% Direct and Indirect Capital Costs)				2,000	
Total Indirect Capital Costs				12,000	
TOTAL CAPITAL COSTS				12,000	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Sediment at 2 Locations	Event	1	5,832	5,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				20,634	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				89,345	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				55,505	
Contingency (20% of O&M Costs)				28,970	
TOTAL O&M PRESENT WORTH COSTS (30 years)				173,821	
TOTAL PRESENT WORTH COSTS				185,821	
Notes:					
CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30					

Table V-6
Alternative 2 - Institutional Controls
for Power Plant No. 3 (SWMU 17)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Total Direct Capital Costs				0	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions (Industrial Site Use Only)	Each	1	5,000	5,000	EE
Apply landuse restrictions (No Excavation Without Approvals/Notifications)	Each	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				10,000	
Contingency (20% Direct and Indirect Capital Costs)				2,000	
Total Indirect Capital Costs				12,000	
TOTAL CAPITAL COSTS				12,000	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annually, inspect/repair sediment cover(s) and maintain vegetation	Event	1	17,148	17,148	EE
Monitor Sediment/surfacewater at 3 Locations	Event	1	6,832	6,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				38,782	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				167,926	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				104,324	
Contingency (20% of O&M Costs)				54,450	
TOTAL O&M PRESENT WORTH COSTS (30 years)				326,700	
TOTAL PRESENT WORTH COSTS				338,700	
Notes:					
CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30					

Table V-7

Alternative 2 - Institutional Controls

for White Alice/Trout Creek Disposal Area (SWMU 20)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Total Direct Capital Costs				0	
INDIRECT CAPITAL COSTS					
Subtotal Indirect Capital Cost					
Contingency (20% Direct and Indirect Capital Costs)					
Total Indirect Capital Costs					
TOTAL CAPITAL COSTS				0	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Repair signs	Event	1	2,712	2,712	CM
Monitoring Report	Event	1	3,600	3,600	EE
Monitor Sediment at 4 Locations	Event	1	8,832	8,832	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				26,346	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				114,078	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				70,871	
Contingency (20% of O&M Costs)				36,990	
TOTAL O&M PRESENT WORTH COSTS (30 years)				221,939	
TOTAL PRESENT WORTH COSTS				221,939	
Notes:					
CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30					

Table V-8

Alternative 2 - Drum Removal/Disposal

for Lake Leone Drum Disposal Area (SWMU 27)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Total Direct Capital Costs				0	
INDIRECT CAPITAL COSTS					
Subtotal Indirect Capital Cost				0	
Contingency (20% Direct and Indirect Capital Costs)				0	
Total Indirect Capital Costs				0	
TOTAL CAPITAL COSTS				0	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Sediment at 4 Locations	Event	1	7,832	7,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
				0	
Annual O&M Costs				22,634	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				98,005	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				60,885	
Contingency (20% of O&M Costs)				31,778	
TOTAL O&M PRESENT WORTH COSTS (30 years)				190,669	
TOTAL PRESENT WORTH COSTS				190,669	
Notes:					
CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30					

Table V-9
Alternative 2 - Institutional Controls
for Sweeper Cove

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs along shorelines	Sign	160	138	22,056	CM
Total Direct Capital Costs				22,056	
INDIRECT CAPITAL COSTS					
Establish Restricted Subsistence and Commercial Fisheries landuse	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency (20% Direct and Indirect Capital Costs)				5,411	
Total Indirect Capital Costs				10,411	
TOTAL CAPITAL COSTS				32,467	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Inspect and repair signs	Event	1	2,712	2,712	EE
Monitor Tissue at 4 Locations	Event	1	7,832	7,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				25,346	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				109,748	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				68,181	
Contingency (20% of O&M Costs)				35,586	
TOTAL O&M PRESENT WORTH COSTS (30 years)				213,515	
TOTAL PRESENT WORTH COSTS				245,982	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-10
Alternative 2 - Institutional Controls
for South Sweeper Creek

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs along shorelines	Sign	50	170	8,524	CM
Total Direct Capital Costs				8,524	
INDIRECT CAPITAL COSTS					
Establish Restricted Subsistence and Commercial Fisheries landuse	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency (20% Direct and Indirect Capital Costs)				2,705	
Total Indirect Capital Costs				7,705	
TOTAL CAPITAL COSTS				16,229	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Inspect and repair signs annually	Event	1	8,524	8,524	CM
Monitor Tissue at 1 Location	Event	1	4,832	4,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
				0	
				0	
				0	
				0	
				0	
Annual O&M Costs				28,158	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				121,924	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				75,745	
Contingency (20% of O&M Costs)				39,534	
TOTAL O&M PRESENT WORTH COSTS (30 years)				237,203	
TOTAL PRESENT WORTH COSTS				253,432	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-11
Alternative 2 - Institutional Controls
for Kuluk Bay

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs along site perimeter	Sign	97	141	13,718	CM
Total Direct Capital Costs				13,718	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions to Industrial Use Only (No Excavation Without Approvals/ Notifications)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency (20% Direct and Indirect Capital Costs)				3,744	
Total Indirect Capital Costs				8,744	
TOTAL CAPITAL COSTS				22,462	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Inspect and repair signs annually	Event	1	2,712	2,712	CM
Monitor Tissue at 5 Locations	Event	1	8,832	8,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				26,346	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				114,078	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				70,871	
Contingency (20% of O&M Costs)				36,990	
TOTAL O&M PRESENT WORTH COSTS (30 years)				221,939	
TOTAL PRESENT WORTH COSTS				244,400	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-12
Alternative 3 - Containment
for Causeway Landfill (SWMU 2)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install 3 Monitoring Wells	Each	3	2,314	6,942	CM
Import Fill for continuous site cover to minimum thickness of two feet	Cubic yard	2,320	23	54,136	CM
Place continuous site cover to minimum thickness of two feet using imported soils	Cubic yard	2,320	15	34,800	CM
Establish vegetation	Acre	3.6	6,008	21,628	FD
Total Direct Capital Costs				117,506	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions (No Excavation Without Approvals/ Notifications)	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	7,050	7,050	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	4,700	4,700	EE
Bond, Insurance, Permitting	Lump Sum	1	1,175	1,175	EE
Subtotal Indirect Capital Cost				17,926	
Contingency (20% Direct and Indirect Capital Costs)				27,086	
Total Indirect Capital Costs				45,012	
TOTAL CAPITAL COSTS				162,518	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Groundwater at 3 Wells and Sediment at 1 Location	Event	1	9,462	9,462	EE
Landfill Monitoring Report	Event	1	4,160	4,160	EE
Inspection and repair of landfill cover& maintain vegetation	Acre	3.6	2,274	8,188	EE
Landfill Inspection/Repair Report	Event	1	4,160	4,160	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,152	11,152	EE
Annual O&M Costs				37,122	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				160,738	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				99,858	
Contingency (20% of O&M Costs)				52,119	
TOTAL O&M PRESENT WORTH COSTS (30 years)				312,716	
TOTAL PRESENT WORTH COSTS				475,234	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-13
Alternative 3 - Containment
for South Davis Road Landfill (SWMU 4)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install 3 Monitoring Wells	Each	3	2,314	6,942	CM
Import Fill for continuous site cover to minimum thickness of two feet	Cubic yard	2,460	24	58,648	CM
Place continuous site cover to minimum thickness of two feet using imported soils	Cubic yard	2,460	15	36,900	CM
Establish vegetation	Acre	3.8	1,926	7,320	FD
Total Direct Capital Costs				109,810	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions (No Excavation Without Approvals/ Notifications)	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	6,589	6,589	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	4,392	4,392	EE
Bond, Insurance, Permitting	Lump Sum	1	1,098	1,098	EE
Subtotal Indirect Capital Cost				17,079	
Contingency (20% Direct and Indirect Capital Costs)				25,378	
Total Indirect Capital Costs				42,457	
TOTAL CAPITAL COSTS				152,267	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Groundwater at 3 Wells and Sediment at 1 Location	Event	1	9,462	9,462	EE
Landfill Monitoring Report	Event	1	4,160	4,160	EE
Inspection and repair of landfill cover & maintain vegetation	Acre	3.8	2,189	8,320	EE
Landfill Inspection/Repair Report	Event	1	4,160	4,160	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,152	11,152	EE
Annual O&M Costs				37,254	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				161,310	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				100,213	
Contingency (20% of O&M Costs)				52,305	
TOTAL O&M PRESENT WORTH COSTS (30 years)				313,828	
TOTAL PRESENT WORTH COSTS				466,095	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-14
Alternative 3 - Containment
for Finger Bay Landfill (SWMU 29)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install 3 Monitoring Wells	Each	3	2,314	6,942	CM
Import Fill for continuous site cover to minimum thickness of two feet	Cubic yard	3,740	23	85,648	CM
Place continuous site cover to minimum thickness of two feet using imported soils	Cubic yard	3,740	15	56,100	CM
Establish vegetation	Acre	5.8	5,829	33,810	FD
Total Direct Capital Costs				182,500	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions (No Excavation Without Approvals/ Notifications)	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	10,950	10,950	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	7,300	7,300	EE
Bond, Insurance, Permitting	Lump Sum	1	1,825	1,825	EE
Subtotal Indirect Capital Cost				25,075	
Contingency (20% Direct and Indirect Capital Costs)				41,515	
Total Indirect Capital Costs				66,590	
TOTAL CAPITAL COSTS				249,090	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Groundwater at 3 Wells and Sediment at 1 Location	Event	1	9,462	9,462	EE
Landfill Monitoring Report	Event	1	4,160	4,160	EE
Inspection and repair of landfill cover& maintain vegetation	Acre	5.8	1,697	9,840	EE
Landfill Inspection/Repair Report	Event	1	9,840	9,840	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,152	11,152	EE
Annual O&M Costs				44,454	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				192,486	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				119,581	
Contingency (20% of O&M Costs)				62,413	
TOTAL O&M PRESENT WORTH COSTS (30 years)				374,480	
TOTAL PRESENT WORTH COSTS				623,570	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-15
Alternative 3 - Containment
for Old Baler Building (SWMU 10)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Import Fill for continuous site cover to minimum thickness of two feet	Cubic yard	7,800	21	163,836	CM
Place continuous site cover to minimum thickness of two feet using imported soils	Cubic yard	7,800	15	117,000	CM
Establish vegetation	Acre	2.4	6,232	14,956	FD
Total Direct Capital Costs				295,792	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions (Industrial Site Use Only)	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	17,748	17,748	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	11,832	11,832	EE
Bond, Insurance, Permitting	Lump Sum	1	2,958	2,958	EE
Subtotal Indirect Capital Cost				37,537	
Contingency (20% Direct and Indirect Capital Costs)				66,666	
Total Indirect Capital Costs				104,203	
TOTAL CAPITAL COSTS				399,995	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Sediment at 2 Locations	Event	1	5,832	5,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				20,634	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				89,345	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				55,505	
Contingency (20% of O&M Costs)				28,970	
TOTAL O&M PRESENT WORTH COSTS (30 years)				173,821	
TOTAL PRESENT WORTH COSTS				573,816	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-16
Alternative 3 - Containment
for Power Plant No. 3 (SWMU 17)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Replace oil.water seperators(OWS) #1 and #2	Each	2	14,613	29,226	CM
Route OWS overflow to sanitary sewer or retention vault	Each	2	12,924	25,848	CM
Waste Oil Pond Dewatering, Temporary Storage, Treatment (oil/water seperation/solids removal), and Characterization for Discharge During Construction	Gallon	235,000	0.23	53,804	VQ
Construct Temporary Sediment Dewatering Cells	Lump Sum	1	9,474	9,474	CM
Import Fill for Waste Oil Pond Sediment Cover - Boulders, Cobbles and Soils	Cubic yard	2,480	25	61,448	CM
Place continuous site cover to minimum thickness of two feet using imported soils	Cubic yard	2,480	15	37,200	CM
Establish Vegetation for Waste Oil Pond	Acre	0.15	18,643	2,797	FD
Total Direct Capital Costs				219,797	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions (Industrial Site Use Only)	Each	1	5,000	5,000	EE
Apply landuse restrictions (No Excavation Without Approvals/Notifications)	Each	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	13,188	13,188	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	8,792	8,792	EE
Bond, Insurance, Permitting	Lump Sum	1	2,198	2,198	EE
Subtotal Indirect Capital Cost				34,178	
Contingency (20% Direct and Indirect Capital Costs)				50,795	
Total Indirect Capital Costs				84,972	
TOTAL CAPITAL COSTS				304,769	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annually, inspect/repair sediment cover(s) and maintain vegetation	Event	1	17,148	17,148	EE
Monitor Sediment/surfacewater at 3 Locations	Event	1	6,832	6,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Product trench inspection/maintenance	Gallon	12,000	8.30	99,540	VQ
Annual O&M Costs				138,322	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				598,934	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				372,086	
Contingency (20% of O&M Costs)				194,204	
TOTAL O&M PRESENT WORTH COSTS (30 years)				1,165,225	
TOTAL PRESENT WORTH COSTS				1,469,993	

Notes
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-17

Alternative 3 - Containment

for Lake Leone Drum Disposal Area (SWMU 27)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Pond Dewatering, Sump/Well Installation and Discharge During Drum Removal	Gallon	200,000	0.06	12,126	CM
Excavate/extract drums and transport to staging area	Each	100	506	50,648	EE
Characterize drums for disposal/ recycling	Sample	12	1,460	17,524	EE
Overpack drums for shipping	Each	100	278	27,800	EE
Ship drums to Subtitle C hazardous waste landfill (assume Washington or Oregon)	Each	100	75	7,488	FD
Dispose drums to Subtitle C hazardous waste landfill (assume Washington or Oregon)	Each	100	69	6,912	FD
Import Fill for drum disposal area	Cubic yard	320	26	8,162	CM
Place continuous site cover to minimum thickness of two feet using imported soils	Cubic yard	320	15	4,800	CM
Total Direct Capital Costs				135,460	
INDIRECT CAPITAL COSTS					
Design/Specifications	Lump Sum	1	8,128	8,128	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	5,418	5,418	EE
Bond, Insurance, Permitting	Lump Sum	1	1,355	1,355	EE
Subtotal Indirect Capital Cost				14,901	
Contingency (20% Direct and Indirect Capital Costs)				30,072	
Total Indirect Capital Costs				44,973	
TOTAL CAPITAL COSTS				180,433	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Sediment at 4 Locations	Event	1	7,832	7,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				22,634	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				98,005	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				60,885	
Contingency (20% of O&M Costs)				31,778	
TOTAL O&M PRESENT WORTH COSTS (30 years)				190,669	
TOTAL PRESENT WORTH COSTS				371,102	

Notes:

CM - cost manual

EE - engineering estimate

FD - former design

O&M - operation and maintenance

O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-18
Alternative 3 - Containment
for Sweeper Cove

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs along shorelines	Sign	160	138	22,056	CM
Sediment Characterization Analysis	Sample	160	1,460	233,600	EE
Sediment Rate/Characterization Study	Hour	6,000	75	450,000	EE
Sediment Disposal Site/Selection Study	Hour	4,000	75	300,000	EE
Placement of 1-foot thick submarine cap in Sweeper Cove and Sweeper Creek	Cubic yard	690,000	20	13,918,464	CM
Total Direct Capital Costs				14,924,120	
INDIRECT CAPITAL COSTS					
Establish Restricted Subsistence and Commercial Fisheries landuse	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	895,447	895,447	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	596,965	596,965	EE
Bond, Insurance, Permitting	Lump Sum	1	149,241	149,241	EE
Subtotal Indirect Capital Cost				1,646,653	
Contingency (20% Direct and Indirect Capital Costs)				3,314,155	
Total Indirect Capital Costs				4,960,808	
TOTAL CAPITAL COSTS				19,884,928	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Inspect and repair signs	Event	1	2,712	2,712	EE
Monitor Tissue at 4 Locations	Event	1	7,832	7,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				25,346	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				109,748	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				68,181	
Contingency (20% of O&M Costs)				35,586	
TOTAL O&M PRESENT WORTH COSTS (30 years)				213,515	
TOTAL PRESENT WORTH COSTS				20,098,443	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

	Table V-19				
	Alternative 3 - Containment				
	for South Sweeper Creek				
	Unit	**Quantity**	**Unit Costs ($)**	**Costs ($)**	**Source**
DIRECT CAPITAL COSTS					
Install signs along shorelines	Sign	50	170	8,524	CM
Sediment Characterization Analysis	Sample	20	1,460	29,200	EE
Sediment Rate/Characterization Study	Hour	800	75	60,000	EE
Sediment Disposal Site/Selection Study	Hour	800	75	60,000	EE
Placement of 1-foot thick sediment cap in Sweeper Creek	Cubic yard	7,300	44	323,748	CM
Total Direct Capital Costs				481,472	
INDIRECT CAPITAL COSTS					
Establish Restricted Subsistence and Commercial Fisheries landuse	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	28,888	28,888	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	19,259	19,259	EE
Bond, Insurance, Permitting	Lump Sum	1	4,815	4,815	EE
Subtotal Indirect Capital Cost				57,962	
Contingency (20% Direct and Indirect Capital Costs)				107,887	
Total Indirect Capital Costs				165,849	
TOTAL CAPITAL COSTS				647,321	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Inspect and repair signs annually	Event	1	8,524	8,524	CM
Monitor Tissue at 1 Location	Event	1	4,832	4,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				28,158	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				121,924	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				75,745	
Contingency (20% of O&M Costs)				39,534	
TOTAL O&M PRESENT WORTH COSTS (30 years)				237,203	
TOTAL PRESENT WORTH COSTS				884,524	
Notes:					
CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30					

	Table V-20				
	Alternative 4 - Removal (Option 1)				
	for Old Baler Building (SWMU 10)				
	Unit	**Quantity**	**Unit Costs ($)**	**Costs ($)**	**Source**
DIRECT CAPITAL COSTS					
Waste storage area surface soil excavation and hauling to barge on Adak	Cubic yard	600	25	14,724	CM
Progress/characterization Sampling & Analysis (soils)	Sample	134	193	25,824	EE
Soil Transport from Adak to Seattle via Barge and Seattle to Subtitle C Landfill via truck/rail	Ton	960	312	299,520	FD
Soil Disposal at Subtitle C Hazardous Waste Landfill	Ton	960	288	276,480	FD
Import Fill for continuous site cover to minimum thickness of two feet	Cubic yard	7,800	21	163,836	CM
Place continuous site cover to minimum thickness of two feet using imported soils	Cubic yard	7,800	15	117,000	CM
Establish vegetation	Acre	2.4	6,232	14,956	FD
Total Direct Capital Costs				912,340	
INDIRECT CAPITAL COSTS					
Subtotal Indirect Capital Cost				0	
Contingency (20% Direct and Indirect Capital Costs)				182,468	
Total Indirect Capital Costs				182,468	
TOTAL CAPITAL COSTS				1,094,808	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual O&M Costs				0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				0	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				0	
Contingency (20% of O&M Costs)				0	
TOTAL O&M PRESENT WORTH COSTS (30 years)				0	
TOTAL PRESENT WORTH COSTS				1,094,808	
Notes:					
CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30					

Table V-21

Alternative 4 - Removal (Option 2) *

for Old Baler Building (SWMU 10)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Waste storage area surface soil excavation and hauling to barge on Adak	Cubic yard	600	25	14,724	CM
Progress/characterization Sampling & Analysis (soils)	Sample	134	193	25,824	EE
Soil Transport from Adak to Seattle via Barge and Seattle to Subtitle C Landfill via truck/rail	Ton	960	312	299,520	FD
Soil incineration at off island incinerator	Ton	960	350	336,000	FD
Import Fill for continuous site cover to minimum thickness of two feet	Cubic yard	7,800	21	163,836	CM
Place continuous site cover to minimum thickness of two feet using imported soils	Cubic yard	7,800	15	117,000	CM
Establish vegetation	Acre	2.4	6,232	14,956	FD
Total Direct Capital Costs				971,860	
INDIRECT CAPITAL COSTS					
Subtotal Indirect Capital Cost				0	
Contingency (20% Direct and Indirect Capital Costs)				194,372	
Total Indirect Capital Costs				194,372	
TOTAL CAPITAL COSTS				1,166,232	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual O&M Costs				0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				0	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				0	
Contingency (20% of O&M Costs)				0	
TOTAL O&M PRESENT WORTH COSTS (30 years)				0	
TOTAL PRESENT WORTH COSTS				1,166,232	

Notes

CM - cost manual

EE - engineering estimate

FD - former design

O&M - operation and maintenance

O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

* - This alternative assumes off-island transport and incineration of contaminated soils. Other technologies evaluated on-island solvent extraction and thermal desorption. These technologies were not cost-effective because of the high mobilization costs and the relatively low volumes of materials to be treated.

Table V-22
Alternative 4 - Removal (Option 1)
for Power Plant No. 3 (SWMU 17)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Replace oil water seperators(OWS) #1 and #2	Each	2	14,613	29,226	CM
Route OWS overflow to sanitary sewer or retention vault	Each	2	12,924	25,848	CM
Waste Oil Pond Dewatering, Temporary Storage, Treatment (oil/water seperation/solids removal), and Characterization for Discharge During Construction	Gallon	235,000	0	53,804	VQ
Construct Temporary Sediment Dewatering Cells	Lump Sum	1	9,474	9,474	CM
Waste oil pond sediment excavation and hauling to barge on Adak	Cubic yard	3,270	18	59,774	CM
Waste Oil Pond Performance-Progress Sampling & Analysis (soil/sediment)	Sample	164	1,308	214,576	EE
Soil Transport from Adak to Seattle via Barge; and from Seattle to Subtitle C Landfill via truck/rail	Ton	5,232	312	1,632,384	FD
Soil Disposal at Subtitle C Hazardous Waste Landfill	Ton	5,232	288	1,506,816	FD
Import Fill for Waste Oil Pond Sediment Cover - Boulders, Cobbles and Soils	Cubic yard	5,470	21	114,836	CM
Place continuous site cover to minimum thickness of two feet using imported soils	Cubic yard	5,470	12	65,640	CM
Establish Vegetation	Acre	1.7	5,310	9,027	FD
Total Direct Capital Costs				3,721,405	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions (Industrial Site Use Only)	Each	1	5,000	5,000	EE
Apply landuse restrictions (No Excavation Without Approvals/Notifications)	Each	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1			EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	148,856	148,856	EE
Bond, Insurance, Permitting	Lump Sum	1	37,214	37,214	EE
Subtotal Indirect Capital Cost				196,070	
Contingency (20% Direct and Indirect Capital Costs)				783,495	
Total Indirect Capital Costs				979,565	
TOTAL CAPITAL COSTS				4,700,970	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annually, inspect/repair sediment cover(s) and maintain vegetation	Event	1	17,148	17,148	EE
Monitor Sediment/surfacewater at 3 Locations	Event	1	6,832	6,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Product trench inspection/maintenance	Gallon	12,000	8.30	99,540	VQ
Annual O&M Costs				138,322	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				598,934	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				372,086	
Contingency (20% of O&M Costs)				194,204	
TOTAL O&M PRESENT WORTH COSTS (30 years)				1,165,225	
TOTAL PRESENT WORTH COSTS				5,866,195	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-23

Alternative 4 - Removal (Option 2) *

for Power Plant No. 3 (SWMU 17)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Replace oil water seperators(OWS) #1 and #2	Each	2	14,613	29,226	CM
Route OWS overflow to sanitary sewer or retention vault	Each	2	12,924	25,848	CM
Waste Oil Pond Dewatering, Temporary Storage, Treatment (oil/water seperation/solids removal), and Characterization for Discharge During Construction	Gallon	235,000	0.23	53,804	VQ
Construct Temporary Sediment Dewatering Cells	Lump Sum	1	9,474	9,474	CM
Import Fill for Waste Oil Pond Sediment Cover - Boulders, Cobbles and Soils	Cubic yard	2,480	25	61,448	CM
Establish Vegetation for Waste Oil Pond	Acre	0.2	18,643	2,797	FD
Waste oil pond sediment excavation and hauling to barge on Adak	Cubic yard	3,270	18	59,774	CM
On-island Solvent Extraction	Ton	5,232	232	1,213,824	FD
Mobilization/demobilization, Assembly of Solvent Extraction Plant	Event	1	1,200,000	1,200,000	FD
Waste residual transport/incineration off-island	Ton	250	662	165,500	FD
				0	
				0	
				0	
				0	
				0	
				0	
				0	
Total Direct Capital Costs				2,821,695	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions (Industrial Site Use Only)	Each	1	5,000	5,000	EE
Apply landuse restrictions (No Excavation Without Approvals/Notifications)	Each	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	169,302	169,302	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	112,868	112,868	EE
Bond, Insurance, Permitting	Lump Sum	1	28,217	28,217	EE
Subtotal Indirect Capital Cost				320,386	
Contingency (20% Direct and Indirect Capital Costs)				628,416	
Total Indirect Capital Costs				948,803	
TOTAL CAPITAL COSTS				3,770,497	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annually, inspect/repair sediment cover(s) and maintain vegetation	Event	1	17,148	17,148	EE
Monitor Sediment/surfacewater at 3 Locations	Event	1	6,832	6,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Product trench inspection/maintenance	Gallon	12,000	8.30	99,540	VQ
				0	
Annual O&M Costs				138,322	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				598,934	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				372,086	
Contingency (20% of O&M Costs)				194,204	
TOTAL O&M PRESENT WORTH COSTS (30 years)				1,165,225	
TOTAL PRESENT WORTH COSTS				4,935,722	

Notes

CM - cost manual

EE - engineering estimate

FD - former design

O&M - operation and maintenance

O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

*- This alternative assumes on-island treatment using solvent extraction, with non-treated wastes transported to off-island treatment/ incineration plant. Other technologies evaluated include on-island thermal desorption and off-island incineration. These process options were estimated to cost between 20 and 35 % more than solvent extraction.

Table V-24

Alternative 4 - Removal (Option 1)

for White Alice/Trout Creek Disposal Area (SWMU 20)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Waste Removal System Equipment Mobilization/Demobilization	Lump Sum	1	20,000	20,000	FD
Drum disposal area surface soil excavation and hauling to barge on Adak	Lump Sum	1	20,000	20,000	CM
Progress/characterization Sampling & Analysis (soils)	Sample	53	304	16,114	EE
Dewatering, containment, Treatment, and Discharge of Surface Water	Lump Sum	1	30,522	30,522	CM
Soil Transport from Adak to Seattle via Barge and Seattle to Subtitle C Landfill via truck/rail	Ton	9	312	2,808	FD
Soil Disposal at Subtitle C Hazardous Waste Landfill	Ton	9	288	2,592	FD
Total Direct Capital Costs				92,036	
INDIRECT CAPITAL COSTS					
Subtotal Indirect Capital Cost				0	
Contingency (20% Direct and Indirect Capital Costs)				18,407	
Total Indirect Capital Costs				18,407	
TOTAL CAPITAL COSTS				110,443	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual O&M Costs				0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				0	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				0	
Contingency (20% of O&M Costs)				0	
TOTAL O&M PRESENT WORTH COSTS (30 years)				0	
TOTAL PRESENT WORTH COSTS				110,443	
Notes:					
CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30					

Table V-25

Alternative 4 - Removal (Option 2)

for White Alice/Trout Creek Disposal Area (SWMU 20)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Waste Removal System Equipment Mobilization/Demobilization	Lump Sum	1	20,000	20,000	FD
Drum disposal area surface soil excavation and hauling to barge on Adak	Lump Sum	1	20,000	20,000	CM
Progress/characterization Sampling & Analysis (soils)	Sample	53	304	16,114	EE
Dewatering, containment, Treatment, and Discharge of Surface Water	Lump Sum	1	30,522	30,522	CM
Soil Transport from Adak to Seattle via Barge and Seattle to Subtitle C Landfill via truck/rail	Ton	9	312	2,808	FD
Soil inceneration at off-island facility	Ton	9	350	3,150	FD
Total Direct Capital Costs				92,594	
INDIRECT CAPITAL COSTS					
Subtotal Indirect Capital Cost				0	
Contingency (20% Direct and Indirect Capital Costs)				18,519	
Total Indirect Capital Costs				18,519	
TOTAL CAPITAL COSTS				111,113	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual O&M Costs				0	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				0	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				0	
Contingency (20% of O&M Costs)				0	
TOTAL O&M PRESENT WORTH COSTS (30 years)				0	
TOTAL PRESENT WORTH COSTS				111,113	

Notes:

CM - cost manual

EE - engineering estimate

FD - former design

O&M - operation and maintenance

O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-26

Alternative 4 - Removal (Option 1)

for Lake Leone Drum Disposal Area (SWMU 27)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Pond Dewatering, Sump/Well Installation and Discharge During Drum Removal	Gallon	200,000	0.06	12,126	CM
Excavate/extract drums and transport to staging area	Each	100	506	50,648	EE
Characterize drums for disposal/ recycling	Sample	12	1,460	17,524	EE
Overpack drums for shipping	Each	100	278	27,800	EE
Ship drums to Subtitle C hazardous waste landfill (assume Washington or Oregon)	Each	100	75	7,488	FD
Dispose drums to Subtitle C hazardous waste landfill (assume Washington or Oregon)	Each	100	69	6,912	FD
Drum disposal area surface soil excavation and hauling to barge on Adak	Cubic yard	50	59	2,962	CM
Progress/characterization Sampling & Analysis (soils)	Sample	35	1,087	38,062	EE
Soil Transport from Adak to Seattle via Barge and Seattle to Subtitle C Landfill via truck/rail	Ton	80	312	24,960	FD
Soil Disposal at Subtitle C Hazardous Waste Landfill	Ton	80	288	23,040	FD
Import Fill for drum disposal area	Cubic yard	50	24	1,200	CM
Place continuous site cover to fill excvated area using imported soils	Cubic yard	50	15	750	CM
Total Direct Capital Costs				213,472	
INDIRECT CAPITAL COSTS					
Design/Specifications	Lump Sum	1	12,808	12,808	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	8,539	8,539	EE
Bond, Insurance, Permitting	Lump Sum	1	2,135	2,135	EE
Subtotal Indirect Capital Cost				23,482	
Contingency (20% Direct and Indirect Capital Costs)				47,391	
Total Indirect Capital Costs				70,873	
TOTAL CAPITAL COSTS				284,345	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual O&M Costs					
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33					
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69					
Contingency (20% of O&M Costs)					
TOTAL O&M PRESENT WORTH COSTS (30 years)					
TOTAL PRESENT WORTH COSTS				284,345	
Notes:					
CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30					

Table V-27

Alternative 4 - Removal (Option 2)

for Lake Leone Drum Disposal Area (SWMU 27)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Pond Dewatering, Sump/Well Installation and Discharge During Drum Removal	Gallon	200,000	0.06	12,126	CM
Excavate/extract drums and transport to staging area	Each	100	506	50,648	EE
Characterize drums for disposal/ recycling	Sample	12	1,460	17,524	EE
Overpack drums for shipping	Each	100	278	27,800	EE
Ship drums to Subtitle C hazardous waste landfill (assume Washington or Oregon)	Each	100	75	7,488	FD
Dispose drums to Subtitle C hazardous waste landfill (assume Washington or Oregon)	Each	100	69	6,912	FD
Drum disposal area surface soil excavation and hauling to barge on Adak	Cubic yard	50	59	2,962	CM
Progress/characterization Sampling & Analysis (soils)	Sample	35	1,087	38,062	EE
Soil Transport from Adak to Seattle via Barge and Seattle to Subtitle C Landfill via truck/rail	Ton	80	312	24,960	FD
Soil inceneration at off-island facility	Ton	80	350	28,000	FD
Import Fill for drum disposal area	Cubic yard	50	24	1,200	CM
Place continuous site cover to fill excvated area using imported soils	Cubic yard	50	15	750	CM
Total Direct Capital Costs				218,432	
INDIRECT CAPITAL COSTS					
Design/Specifications	Lump Sum	1	13,106	13,106	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	8,737	8,737	EE
Bond, Insurance, Permitting	Lump Sum	1	2,184	2,184	EE
Subtotal Indirect Capital Cost				24,028	
Contingency (20% Direct and Indirect Capital Costs)				48,492	
Total Indirect Capital Costs				72,519	
TOTAL CAPITAL COSTS				290,951	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual O&M Costs					
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33					
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69					
Contingency (20% of O&M Costs)					
TOTAL O&M PRESENT WORTH COSTS (30 years)					
TOTAL PRESENT WORTH COSTS				290,951	
Notes:					
CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30					

Table V-28					
Alternative 4 - Removal (Option 1)					
for Sweeper Cove					
	Unit	**Quantity**	**Unit Costs ($)**	**Costs ($)**	**Source**
DIRECT CAPITAL COSTS					
Install signs along shorelines	Sign	160	138	22,056	CM
Sediment Characterization Analysis	Sample	160	1,460	233,600	EE
Sediment Rate/Characterization Study	Hour	6,000	75	450,000	EE
Sediment Disposal Site/Selection Study	Hour	4,000	75	300,000	EE
Obtain off-shore disposal approvals	Site	1	50,000	50,000	EE
Dredging equipment mobilization/ demobilzation (Hydraulic or Clamshell)	Dredge	3	72,300	216,900	CM
Dredge marine sediment to a depth of 1-foot in Sweeper Cove - Open water disposal	Cubic yard	740,000	21	15,495,064	CM
Remove miscellaneous debris from dredge material and dispose - island landfill	Cubic yard	733	15	10,995	CM
Performance-Progress Sampling & Analysis (marine sediment)	Sample	430	1,850	795,500	EE
Performance- Verification Sampling & Analysis (soil/sediment)	Sample	112	1,243	139,216	EE
Characterization for Disposal (soil/sediment)	Sample	430	1,243	534,490	EE
Total Direct Capital Costs				18,247,821	
INDIRECT CAPITAL COSTS					
Establish Restricted Subsistence and Commercial Fisheries landuse	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	1,094,869	1,094,869	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	729,913	729,913	EE
Bond, Insurance, Permitting	Lump Sum	1	182,478	182,478	EE
Subtotal Indirect Capital Cost				2,012,260	
Contingency (20% Direct and Indirect Capital Costs)				4,052,016	
Total Indirect Capital Costs				6,064,277	
TOTAL CAPITAL COSTS				24,312,098	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Inspect and repair signs	Event	1	2,712	2,712	EE
Monitor Tissue at 4 Locations	Event	1	7,832	7,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				25,346	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				109,748	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				68,181	
Contingency (20% of O&M Costs)				35,586	
TOTAL O&M PRESENT WORTH COSTS (30 years)				213,515	
TOTAL PRESENT WORTH COSTS				24,525,612	
Notes:					
CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30					

Table V-29
Alternative 4 - Removal (Option 2)
for Sweeper Cove

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs along shorelines	Sign	160	138	22,056	CM
Sediment Characterization Analysis	Sample	160	1,460	233,600	EE
Sediment Rate/Characterization Study	Hour	6,000	75	450,000	EE
Sediment Disposal Site/Selection Study	Hour	4,000	75	300,000	EE
Obtain off-shore disposal approvals	Site	1	50,000	50,000	EE
Dredging equipment mobilization/ demobilzation (Hydraulic or Clamshell)	Dredge	3	72,300	216,900	CM
Dredge marine sediment to a depth of 1-foot in Sweeper Cove - Open water disposal	Cubic yard	740,000	21	15,495,064	CM
Remove miscellaneous debris from dredge material and dispose - island landfill	Cubic yard	733	15	10,995	CM
Performance-Progress Sampling & Analysis (marine sediment)	Sample	430	1,850	795,500	EE
Performance- Verification Sampling & Analysis (soil/sediment)	Sample	112	1,243	139,216	EE
Characterization for Disposal (soil/sediment)	Sample	430	1,243	534,490	EE
Mobilization/demobilization, Assembly of Solvent Extraction Plant	Event	4	1,200,000	4,800,000	CM
On-island Solvent Extraction	Ton	1,160,320	162	188,435,968	CM
Off-island incineration	Ton	23,680	350	8,288,000	CM
Waste residual transport/incineration off-island	Ton	23,680	662	15,676,160	CM
Total Direct Capital Costs				235,447,949	
INDIRECT CAPITAL COSTS					
Establish Restricted Subsistence and Commercial Fisheries landuse	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	14,126,877	14,126,877	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	9,417,918	9,417,918	EE
Bond, Insurance, Permitting	Lump Sum	1	2,354,479	2,354,479	EE
				0	
				0	
				0	
				0	
Subtotal Indirect Capital Cost				25,904,274	
Contingency (20% Direct and Indirect Capital Costs)				52,270,445	
Total Indirect Capital Costs				78,174,719	
TOTAL CAPITAL COSTS				313,622,668	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Inspect and repair signs	Event	1	2,712	2,712	EE
Monitor Tissue at 4 Locations	Event	1	7,832	7,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
				0	
				0	
				0	
				0	
				0	
Annual O&M Costs				25,346	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				109,748	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				68,181	
Contingency (20% of O&M Costs)				35,586	
TOTAL O&M PRESENT WORTH COSTS (30 years)				213,515	
TOTAL PRESENT WORTH COSTS				313,836,183	
Notes					
CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30					

Table V-30

Alternative 4 - Removal (Option 1)

for South Sweeper Creek

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs along shorelines	Sign	50	170	8,524	CM
Sediment Characterization Analysis	Sample	20	1,460	29,200	EE
Sediment Rate/Characterization Study	Hour	800	75	60,000	EE
Sediment Disposal Site/Selection Study	Hour	800	75	60,000	EE
Obtain off-shore disposal approvals	Site	1	50,000	50,000	EE
Dredge sediment to a depth of 1-foot in Sweeper Creek	Cubic yard	7,300	30	221,548	CM
Performance-Progress Sampling & Analysis (marine sediment)	Sample	5	1,850	9,250	EE
Performance- Verification Sampling & Analysis (soil/sediment)	Sample	2	1,243	2,486	EE
Characterization for Disposal (soil/sediment)	Sample	5	1,243	6,215	EE
Dispose of Dredge sediments from Sweeper Creek off shore up to 20 miles	Cubic yard	7,300	21	156,511	CM
Total Direct Capital Costs				603,734	
INDIRECT CAPITAL COSTS					
Establish Restricted Subsistence and Commercial Fisheries landuse	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	36,224	36,224	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	24,149	24,149	EE
Bond, Insurance, Permitting	Lump Sum	1	6,037	6,037	EE
Subtotal Indirect Capital Cost				71,411	
Contingency (20% Direct and Indirect Capital Costs)				135,029	
Total Indirect Capital Costs				206,440	
TOTAL CAPITAL COSTS				810,174	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Inspect and repair signs annually	Event	1	8,524	8,524	CM
Monitor Tissue at 1 Location	Event	1	4,832	4,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				28,158	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				121,924	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				75,745	
Contingency (20% of O&M Costs)				39,534	
TOTAL O&M PRESENT WORTH COSTS (30 years)				237,203	
TOTAL PRESENT WORTH COSTS				1,047,377	

Notes:

CM - cost manual

EE - engineering estimate

FD - former design

O&M - operation and maintenance

O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

Table V-31					
Alternative 4 - Removal (Option 2)					
for South Sweeper Creek					
	Unit	**Quantity**	**Unit Costs ($)**	**Costs ($)**	**Source**
DIRECT CAPITAL COSTS					
Install signs along shorelines	Sign	50	170	8,524	CM
Sediment Characterization Analysis	Sample	20	1,460	29,200	EE
Sediment Rate/Characterization Study	Hour	800	75	60,000	EE
Sediment Disposal Site/Selection Study	Hour	800	75	60,000	EE
Obtain off-shore disposal approvals	Site	1	50,000	50,000	EE
Dredge sediment to a depth of 1-foot in Sweeper Creek	Cubic yard	7,300	30	221,548	CM
Performance-Progress Sampling & Analysis (marine sediment)	Sample	5	1,850	9,250	EE
Performance- Verification Sampling & Analysis (soil/sediment)	Sample	2	1,243	2,486	EE
Characterization for Disposal (soil/sediment)	Sample	5	1,243	6,215	EE
Hauling of excavated dredge material up to 2 miles	Cubic yard	7,300	7.5	54,750	CM
Dispose of Dredge sediments from Sweeper Creek off shore up to 20 miles	Cubic yard	7,300	21	156,511	CM
Mobilization/demobilization, Assembly of Solvent Extraction Plant	Event	1	1,200,000	1,200,000	CM
On-island Solvent Extraction	Ton	11,096	232	2,574,272	CM
Off-island incineration	Ton	584	350	204,400	CM
Waste residual transport/incineration off-island	Ton	584	662	386,608	EE
Total Direct Capital Costs				5,023,764	
INDIRECT CAPITAL COSTS					
Establish Restricted Subsistence and Commercial Fisheries landuse	Site	1	5,000	5,000	EE
Design/Specifications	Lump Sum	1	301,426	301,426	EE
Construction Oversight - Field/Office Engineering	Lump Sum	1	200,951	200,951	EE
Bond, Insurance, Permitting	Lump Sum	1	50,238	50,238	EE
Subtotal Indirect Capital Cost				557,614	
Contingency (20% Direct and Indirect Capital Costs)				1,116,276	
Total Indirect Capital Costs				1,673,890	
TOTAL CAPITAL COSTS				6,697,654	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Inspect and repair signs annually	Event	1	8,524	8,524	CM
Monitor Tissue at 1 Location	Event	1	4,832	4,832	EE
Monitoring Report	Event	1	3,600	3,600	EE
Periodic Site Review - Monitoring/ Inspection Results, and Revaluate Status	Event	1	11,202	11,202	EE
Annual O&M Costs				28,158	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				121,924	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				75,745	
Contingency (20% of O&M Costs)				39,534	
TOTAL O&M PRESENT WORTH COSTS (30 years)				237,203	
TOTAL PRESENT WORTH COSTS				6,934,857	
Notes:					
CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30					

Table V-32
Cost Elements for Remedial Alternatives

Element No.	Element Description	Cost Type	Unit	Unit Costs ($)	Source
Site Activities(Equipment/Earthwork, Materials)					
1	Fencing, 6-foot chain link, installed	D	Linear Foot	29	CM
2	Gates, 6-foot chain link, installed	D	Linear Foot	57	CM
3	Signs (2' x 2'), installed	D	Each	102	CM
4	Signs (2' x 2') and posts, installed	D	Each	129	CM
5	Signs (6' x 6') and posts, installed	D	Each	645	CM
6	Large Tundra Crawler Rental (incl. mob/demob)	D	Month	4,500	CM
8	Oil/Water Seperator, installed	D	each	7,365	CM
10	UXO location/removal (includes, Labor, Materials, Travel, Per Diem, Mob/demob)	D	Acre	1,800,000	NAVY
11	Waste Removal System Equipment Mobilization/Demobilization	D	Lump Sum	20,000	CM
12	Dredging equipment mobilization/ demobilzation (Hydraulic or Clamshell)	D	Lump Sum	72,300	CM
13	Relocation of dredging equipment to/ from Barge (Hydraulic or Clamshell)	D	Lump Sum	14400	CM
14	Hydraulic Dredging, Dumped into Scows, Dumped up to 5 miles offshore	D	Cubic yard	18.75	CM
15	Clamshell Dredging, Pumped up to 1,000 feet onshore	D	Cubic yard	18.75	CM
16	Freshwater Cover Placement (Pontoon Dredge)	D	Cubic yard	48	CM
17	Fill/topsoil from borrow area: excavate, load, haul up to 5 miles , place & compact	D	Cubic yard	47	CM
18	Fill/topsoil from borrow area: excavate, load, haul up to 5 miles, place	D	Cubic yard	41	FD
19	Fill/topsoil	D	Cubic yard	20	FD
20	General excavation/hauling up to 5 miles	D	Cubic yard	15	FD
21	General excavation/hauling up to 200 yards	D	Cubic yard	12	FD
22	Soil incineration at off island incinerator	D	Ton	350	FD
23	On-island Thermal Desorption	D	Ton	295	FD
24	Mobilization/demobilization, Assembly of Thermal Desorption Plant	D	Round Trip	1,500,000	FD
25	On-island Solvent Extraction	D	Ton	232	FD
26	Mobilization/demobilization, Assembly of Solvent Extraction Plant	D	Round Trip	1,200,000	CM
27	Waste residual transport/incineration off-island	D	Ton	662	EE
28	Roadway Demolition (6-inch thick asphalt)	D	Square Foot	1	FD
29	Establish Vegetation	D	Acre	5,310	EE
30	Annual Maintenance of Vegetation	O&M	Acre	660	EE
32	Construct Temporary Sediment Dewatering Cells	D	Lump Sum	3,500	CM
33	Freshwater Cover Placement (Clamshell)	D	Cubic yard	19	CM
34	Marine Cover Placement (Barge-mounted Hydraulic)	D	Cubic yard	18.75	CM
35	Clear and Grub vegetation less than 6-in diam, and remove stumps	D	Acre	4,470	CM
36	Burn Cleared/Grub vegetation	D	Acre	2,250	CM
37	Dewatering waterbody during construction(100 gallons per minute @ 8 hours/day)	D	Gallon	0	VQ
38	Pretreatment of waterbody extract (oil water separation and solids removal)	D	Lump Sum	7,500	VQ
39	Dewatering tank transportation	D	Lump Sum	6,000	VQ
40	Dewatering sump/well (10 linear feet deep, 12-inch diam steel)	D	Lump Sum	323	EE
41	Annual fence/sign repair, labor and materials	O&M	Lump Sum	5,000	EE
42	Annual resident seminars/visitor briefings	O&M	Site	2,000	EE
43	Annual landfill cover repair, labor and materials	O&M	Lump Sum	5,000	EE
44	Route OWS overflow to sanitary or retention vault	D	Lump Sum	8,000	CM
45	Initial dewatering of waste oil pond	D	Lump Sum	5,000	EE
46	Generic Analytical Suite	D	Each	1,000	EE
47	25-foot, 2-inch diameter PVC Monitoring Well - Installed	D	Each	900	CM
48	Health/Safety Plan & Implemenation	D	Each	1,000	EE
49	PCB Analysis	D	Each	150	EE
50	Sediment Characterization Analysis	D	Sample	1,460	EE
Transportation and Hazardous Material Handling					
51	Transport (Barge) shipping containers from Adak to Seattle	D	Ton	250	FD
52	Transport (Trucking/rail) shipping containers from Seattle to Subtitle C Landfill	D	Ton	62	FD
53	Disposal at Subtitle C Hazardous Waste Landfill	D	Ton	288	FD
54	Disposal of debris at Adak Landfill	D	Ton	0	FD
55	Drum Overpacking	D	Each	250	EE
56	Drum Extraction and Staging	D	Each	400	EE
57	Drum Characterization for Disposal/Recycling	D	Composite Sample	900	EE
58	Product tank rental (5500-gallon capacity)	O&M	Lump Sum	5,900	EE
59	Product tank transportation	O&M	Lump Sum	21,600	EE
60	Product disposal/recycling (diesel to gasoline range)	O&M	Gallon	0	VQ
61	Equipment/materials barge transport Seattle to Adak or Adak to Seattle	D	Ton	250	
62	Airfare, Seattle to Adak	D	Round trip	1,612	EE
Contractor (Transportation, Per Diem, and Labor)					
63	Per Diem (Adak)	D	Person-Day	50	EE
64	Per Diem (Anchorage)	D	Person-Day	200	EE
65	Equipment Operator, medium equipment	D	Day	506	CM
66	Truck Driver, heavy equipment	D	Day	445	CM
67	Laborer	D	Day	394	CM
68	Foreman	D	Day	546	CM
69	Master mechanic	D	Day	529	CM

Table V-32 (continued)
Cost Elements for Remedial Alternatives

Element No.	Element Description	Cost Type	Unit	Unit Costs ($)	Source
Engineering					
70	Field engineer	D	Day	422	CM
71	Annual Field inspection/Repair	O&M	Lump Sum	3,800	EE
72	Health & Safety Monitoring (soil, air)	D	Day	400	EE
73	Performance-Progress Sampling & Analysis (soil/sediment)	D	Sample	1,243	EE
74	Performance-Progress Sampling & Analysis (marine sediment)	D	Sample	1,850	EE
75	Performance- Verification Sampling & Analysis (soil/sediment)	D	Sample	1,243	EE
76	Characterization for Disposal (soil/sediment)	D	Sample	1,243	EE
77	Characterization for Discharge (surfacewater)	D	Sample	1,243	EE
78	Tissue Sampling & Analysis	O&M	Sample	2,438	EE
79	Surface-water Sampling & Analysis	O&M	Sample	1,243	EE
80	Field Kit	D	Day	150	EE
81	Report Production	D	Each	1,000	EE
82	Implement Land Use Restrictions	I	Lump sum	5,000	EE
83	Legal Landuse Restrictions Language and Recording	D	Each	5,000	EE
84	Conduct Site Review (Year 5)	O&M	Lump Sum	2,500	EE
85	Obtain off-shore disposal approvals	I	Lump Sum	50,000	EE
86	Sediment Rate/Characterization Study	D	Hour	75	EE
87	Sediment Disposal Site/Selection Study	D	Hour	75	EE
84	Periodic inspection - Product trench	O&M	Lump Sum	6,240	EE
85	Periodic maintenance - Product trench	O&M	Lump Sum	6,000	EE
86	Project Engineer	D	Day	560	EE
87	Senior Engineer	I	Day	720	EE
UXO Clearance Activities(Labor, Equipment, Materials)					
88	Labor - Surface Clearance (Crew)	D	Acre	1,049	RA
89	Materials/ Equipment - Surface Clearance	D	Acre	153	RA
90	Mobilization/demobillization - Surface Clearance	D	Lump Sum	187,400	RA
91	Travel- Surface Clearance (Crew) per 30 days	D	Trip	20,400	RA
92	Per Diem - Surface Clearance (Crew)	D	Day	2,040	RA
93	Labor - Geophysical Survey/Data Managment (Crew)	D	Acre	2,595	RA
94	Material / Equipment - Geophysical Survey/Data Management	D	Acre	328	RA
95	Mobilization/demobillization - Geophysical Survey/Data Management	D	Lump Sum	294,400	RA
96	Travel - Geophysical Survey/Data Managment (Crew) per 30 days	D	Trip	37,600	RA
97	Per Diem - Geophysical Survey/Data Managment (Crew)	D	Day	2,880	RA
98	Labor - UXO Clearance to 1-foot Depth (Crew)	D	Acre	2,382	RA
99	Material / Equipment - UXO Clearance to 1-foot Depth	D	Acre	374	RA
100	Mobilization/demobillization - UXO Clearance to 1-foot Depth	D	Lump Sum	600000	RA
101	Travel- UXO Clearance to 1-foot Depth (Crew) per 30 days	D	Trip	48000	RA
102	Per Diem - UXO Clearance to 1-foot Depth (Crew)	D	Day	3720	RA
103	Labor - UXO Clearance to 4-foot Depth (Crew)	D	Acre	13233.33	RA
104	Material / Equipment - UXO Clearance to 4-foot Depth	D	Acre	1744	RA
105	Mobilization/demobillization - UXO Clearance to 4-foot Depth	D	Lump Sum	600000	RA
106	Travel - UXO Clearance to 4-foot Depth (Crew) per 30 days	D	Trip	48000	RA
107	Per Diem - UXO Clearance to 4-foot Depth (Crew)	D	Day	3720	RA
108	Labor - UXO Clearance to 10-foot Depth Geophysical Method (Crew)	D	Acre	1,148,000	RA
109	Material / Equipment - UXO Clearance to 10-foot Depth Geophysical Method	D	Acre	277,233	RA
110	Mobilization/demobillization - UXO Clearance to 10-foot Depth Geophysical Method	D	Lump Sum	600,000	RA
111	Travel - UXO Clearance to 10-foot Depth Geophysical Method (Crew) per 30 days	D	Trip	82,000	RA
112	Per Diem - UXO Clearance to 10-foot Depth Geophysical Method (Crew)	D	Day	6,360	RA
113	Labor - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew)	D	Acre	489,000	RA
114	Material / Equipment - UXO Clearance to 10-foot Depth Dig & Screen Method	D	Acre	287,500	RA
115	Mobilization/demobillization - UXO Clearance to 10-foot Depth Dig & Screen Method	D	Lump Sum	600,000	RA
116	Travel - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew) per 30 days	D	Trip	115,000	RA
117	Per Diem - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew)	D	Day	8880	RA
118	Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis, Materials)	D	Event	3,825	EE/EOD

Notes:

CM	construction manual ((Means Building Construction Cost Data, 10th Annual Edition, Western Edition, 1997)
EE	engineering estimate
FD	former design
O&M	operation and maintenance
OWS	oil/water separator
EOD	estimate from Navy Explosive Ordnance Disposal Detachment, 1/10/97
VQ	vendor quote
RA	actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)

Table V-33
Assumptions for Remedial Alternatives

SITE	ASSUMPTION CATEGORY	DESCRIPTION
Common to one or more FS Sites	Infrastructure	-power plant will be operational with power available for remedial activities -existing water supply system operational with water available for remedial activities -existing water treatment system operational and available for remedial activities (with appropriate controls, approvals) -existing port and airport facilities open and functional for transport of labor, materials, equipment at no additional cost
	Equipment and facilities	-room/board facilities on Adak available in existing structures and with staff (including structures, kitchen, staff, sewer, water, electricity, food, etc.) -transportation on Adak for remediation workers and supplies available at no additional cost -equipment repair facilities on Adak available with tools, etc. -all remediation equipment (earthwork, treatment, etc.) imported at cost
	Transport to/ from Adak	Per person on a roundtrip basis from Seattle to Adak via Anchorage (crew rotation every 6 months for activities longer than three months)
	Per diem	Greatest activity duration-crew size combination (duration x crew size), assuming remediation workers will be conducting multiple tasks while on island
	Engineering design	Includes four design submittals: 6% of total direct costs unless otherwise noted
	Construction oversight	Construction oversight- office/field engineering: 4% of total direct costs unless otherwise noted
	Bond, insurance, permitting	1% of total direct costs
	Contingencies	20% of total indirect and direct costs
	Discount rate on present worth analysis	5%
	Land use restrictions	Includes costs for attorneys, consultants, and expenses/fees to apply for modifications to NAF Adak master plan (per site)
	Access restrictions	Includes installation of fences, gates, and/or signs
	Compliance monitoring costs	Includes costs for sampling equipment, field labor, sample analysis (field kit or laboratory), data management, and data validation. -generic analytical suite: unit costs for sample collection, analysis, and reporting includes four analyses for each point of monitoring to cover all COCs (TIN, SVOC, P/A, D/F) or $250 x 4=$1,000 -field analysis unit cost = 1/4 lab analysis unit cost or $250 -sampling of marine dredge unit costs = 1.5 x terrestrial analysis unit costs or $1,443 -tissue sample unit costs = 2 x terrestrial analysis unit costs or $1,850 -sediment characterization analysis: unit costs for sample collection, analysis, and reporting includes four of five analyses for each point of monitoring to cover (Physical Characteristics, TIN, SVOC, P/A, D/F): $1,460
	Compliance monitoring frequency	-health and safety monitoring (continuous monitoring on a per site basis) -performance-progress sample frequency for soil/sediments (1 per 50 cubic yards) -performance-verification sample frequency for soil/sediments (1 per 200 cubic yards) -characterization for disposal sample frequency for soil/sediments (1 per 500 tons) -performance-progress sample frequency for marine sediments (1 per acre) -performance-verification sample frequency for marine sediments (1 per 4 acres) -characterization for disposal sample frequency for marine sediments (1 per 500 tons) -characterization for disposal sample frequency for surface-water (1 per day)
	Sediment density (tons)	Sediment density (drained) assumed to be 1.6 tons per cubic yard
	Soil density (tons)	Soil density assumed to be 1.5 tons per cubic yard
	Sediment dewatering cells construction (temporary)	Includes grading, berm construction, erosion control, sump construction, dewatering tank rental, design engineering, and construction oversight
	Vegetation establishment	Includes materials and labor for 1 acre of tundra grass (1 acre per day - 3 person crew)
	Soil volume	Soil volumes are in-place calculations
Unexploded Ordnance	Educational requirements	One seminar will be conducted for each of the four sites annually
	Clearing transects for access restrictions	Assumptions for clearing transects summarized in cost estimate prepared for the Navy (Dated August 11, 1997)
	UXO location and removal	Assumptions for locating and removing UXO summarized in cost estimate prepared for the Navy (Dated August 11, 1997)
	UXO location and detonation	Cost estimate provided by Navy (Dated January 9, 1997) includes labor, materials, equipment, per diem, travel, and permitting (if applicable)

Table V-33 (continued)
Assumptions for Remedial Alternatives

SITE TYPE	ASSUMPTION CATEGORY	DESCRIPTION
Unexploded Ordnance (continued)	Clearing transects for access restrictions	All transects for areas with access control implementation (fence, signs, and gate installation) will be cleared by the Navy EOD Unit. If UXO is present along a proposed transect, alternate locations will be designated by the Navy EOD
	Access restrictions (all UXO sites) quantities	-per FW work plan (2/14/97) w/ assumptions for SA 93 -fences (linear feet): SWMU 1 (18,600'); SWMU 2 (6,000'); SA 93 (11,400') -signs (total)): SWMU 1 (281); SWMU 2 (90); and SA 93 (171) -signs & posts (total)): SWMU 8 (78 - 6' x 6'); and SA 93 (36) -gates (total): SWMU 1 (1 - west gate); SWMU 8 (1 - east gate-sea wall); and SA 93 (1-southeast access road)
	Access restrictions SWMU 2 - minefield	-fence (6,000'); and signs (90)
	Access restrictions SWMU 8 - shoreline	-gate (1 - east gate at sea wall); and signs (39 - 6' x 6') Cost of 6' x 6' sign and posts for SWMU 8 shoreline assumed to be 5 times cost of 2' x 2' sign and posts
Landfills -SWMUs 2,4,29	Cover thickness	Half of existing landfill cover (6.6 acres) to a depth of 2 feet will need replacement
	Cover material	Half of needed fill will be imported from borrow area on Adak, and half of fill will come from on-site (where cover is greater than 2 feet thick)
	Periodic site inspection - Landfill covers	Includes costs for additional 120 cubic yards of borrow material (40 cubic yards per site), trucking, placement, compaction, and 1 week construction oversight
Old Baler Building - SWMU 10	Cover thickness/volume (SWMU 10 only) Soil disposal/treatment options	Surface soil cover assumed to be 2 feet x 2.4 acres (Alternative 3); excavate and remove 50 ft x 50 ft X 1 foot deep area (Alternative 4 - Options 1 or 2; described below) Option 1: off-island transport/disposal of excavated soils; Option 2: Off-island incineration of excavated soils.
Power Plant No.3 - SWMU 17	Dewatering (pond)	Water will be pumped from pond with a centrifugal pump to 18,000-gallon tank with oil/water separation and sediment retention. Four sumps/wells will be installed to complete dewatering of pond. Extracted water will be pumped to sanitary sewer on site.
	Water volume (pond)	Assumed 3 feet of water x 0.14 acres X 2 (dewater and discharge to sewer)
	Oil water separator type	Two concrete vaults with capacity of 40 gallons (300 cubic feet) each
	Pond cover thickness/volume Surface soil/ephemeral sediment cover Soil disposal/treatment options	Subsurface soil cover assumed to be 5 feet x 0.15 acres and excavated sediment (5 feet x 0.15 acres) to be replaced with imported fill (Alternative 3) Subsurface soil cover assumed to be 2 feet x 1.4 acres and excavated soil (1 foot x 1.4 acres) will be disposed off-island at hazardous waste landfill (Alternative 4 - Options 1 or 2; described below). Option 1: off-island transport/disposal; Option 2: On-island treatment (solvent extraction)
	Periodic monitoring	Annual monitoring on Yakutat creek at five locations (samples) for SVOCs, P/A, & TIN
	Periodic site inspection - cover systems	Includes costs for additional 40 cubic yards of borrow material (20 cubic yards per cover), trucking, placement, compaction, and 1 week construction oversight
	Product trench maintenance	Includes 3 portable tanks rented for 1 year to transport product; tank weight of 7200 lbs/tank shipped 24 times per year (r/t); 12,000 gallons per year of product; and composition is diesel (JP-5) to be disposed as a non-hazardous waste off island
Drum Disposal Area - SWMU 20	Sediment thickness & volume	Sediment Cover thickness of DDA assumed to be 1 foot x 0.017 acres (Alternative 3); excavated soil (6 X(4 foot X 4 foot X 1.5 foot area)) will be disposed of off island at hazardous waste landfill (Alternative 4)
	Soil disposal/treatment options	Option 1: off-island transport/disposal of excavated soils; Option 2: Off-island incineration of excavated soils.

Table V-33 (continued)
Assumptions for Remedial Alternatives

SITE TYPE	ASSUMPTION CATEGORY	DESCRIPTION
Drum Disposal Area - SWMU 27	Drum volume	Drums are completely full of sediments
	Sediment drum density	Sediment density assumed to be 1.6 tons per cubic yard
	Drum contents	Drum contents are hazardous waste and will likely require characterization and disposal off island at a hazardous waste landfill
	Drum overpacking	Includes labor, equipment, materials, and loading of 15 drums per day into shipping containers
	Drum extraction/ staging	Extraction and transportation to staging area of 15 drums per day with an excavator and support truck, establish temporary staging area for containment of drums
	Sediment thickness & volume	Sediment Cover thickness of DDA pond assumed to be 1 foot x 0.2 acres (Alternative 3); excavated soil (1 foot x 0.2 acres) will be disposed of off island at hazardous waste landfill (Alternative 4)
	Soil disposal/treatment options	Option 1: off-island transport/disposal of excavated soils; Option 2: Off-island incineration of excavated soils.
Sweeper Cove	Soil cover volume	1-foot thickness X 430 acres (690,000 cubic yards)
	Dredging volume	1-foot thickness X 460 acres (740,000 cubic yards)
	Duration and number of dredges	Assumes 460 acre-ft (740,000 cubic yards) sediment cover or dredging, 3 dredges would needed (1,050 cubic yards/day) to complete project in approximately 24 months. Excludes time for engineering design, planning & permitting prior to actual field work.
	Dredge material disposal	Open water disposal off-island (up to 20 miles at sea)
	Quantity of debris disposed on island	One-tenth (0.1) percent of 460 acre-ft (740 cubic yards) of debris will be disposed at on island landfill without a disposal fee
	Debris density	Debris density assumed to be 1.6 tons per cubic yard
	Periodic monitoring	Annual monitoring on Sweeper Cove at nine locations(samples) for P/A, and TIN
	Pre-design Sweeper Cove Sediment Study	Sediment characterization, sedimentation rate study, and tidal flow study; siting of off-shore disposal areas
South Sweeper Creek	Soil cover volume	1-foot thickness over 5 acres (7,300 cubic yards)
	Dredging volume	1-foot thickness over 5 acres (7,300 cubic yards)
	Dredge material disposal	Open water disposal off-island (up to 20 miles at sea)
	Periodic monitoring	Annual monitoring on Sweeper Cove at one location (sample) for P/A, and TIN
	Pre-design South Sweeper Creek Sediment Study	Sediment characterization, sedimentation rate study, and tidal flow study; siting of off-shore disposal areas
Kuluk Bay	Periodic monitoring	Annual monitoring in Kuluk Bay at five locations (samples) for P/A, and TIN

Table V-34
Alternative P1-2 - Clear UXO in Parcel 1

	Unit	Quantity	Unit Cost ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Clear and Destroy UXO	Acre	3,277	4,520 - 4,172,800	$14.8 Million - 13,670 Million	
Total Direct Capital Costs					
INDIRECT CAPITAL COSTS					
	Site				EE
	Lump Sum				EE
	Lump Sum				EE
	Lump Sum				EE
Subtotal Indirect Capital Cost					
Contingency (20% Direct and Indirect Capital Costs)					
Total Indirect Capital Costs					
TOTAL CAPITAL COSTS					
ANNUAL OPERATION AND MAINTENANCE COSTS					
	Site				EE
	Site				EE
	Site				EE
Project Management					
Subtotal O&M Costs					
Contingency (20% of O&M Costs)					
Total Annual O&M Costs					
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33					
TOTAL PRESENT WORTH COSTS				$14.8 Million to $13,670 Million	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
UXO - unexploded ordnance

$25,000/ACRE

Table V-35
Alternative P1-3 - UXO Clearance to 4 Feet at Parcel 1 and Institutional Controls

	Unit	Quantity	Unit Cost ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Locate and Destroy UXO	~400 acres	1	10,000,000	10.0 Million	Navy
Signs	Signs	688	129	88,752	EE
Total Direct Capital Costs				**10.1 Million**	
INDIRECT CAPITAL COSTS					
Design (3%)		1		2,700	EE
Construction and Insurance (20%)		1		17,750	EE
Subtotal Indirect Capital Cost				20,450	
Contingency (20% Direct and Indirect Capital Costs)				21,840	
Total Indirect Capital Costs				42,290	
TOTAL CAPITAL COSTS				10.1 Million	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Site Inspection	Site	1		6,734	EE
Site Review	Site	1		1,200	EE
Education	Site	1		5,000	EE
Project Management				2,835	
Subtotal O&M Costs				15,769	
Contingency (20% of O&M Costs)				3,150	
Total Annual O&M Costs				18,900	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				82,000	
TOTAL PRESENT WORTH COSTS				$10.2 Million	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
UXO - unexploded ordnance

Table V-36
Alternative P2-2 - Institutional Controls for Parcels 2, 3, and 5

	Unit	Quantity	Unit Cost ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
	Signs	8,477	129	$1.1 Million	EE
Total Direct Capital Costs					
INDIRECT CAPITAL COSTS					
Design (3%)	Lump Sum	1		32,805	EE
Construction and Insurance (20%)	Lump Sum	1		218,707	EE
Subtotal Indirect Capital Cost				251,512	
Contingency (20% Direct and Indirect Capital Costs)				270,302	
Total Indirect Capital Costs				522,000	
TOTAL CAPITAL COSTS				$1.6 Million	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Site Inspection	Site	1		33,670	EE
Site Review	Site	1		3,600	EE
Education	Site	1		15,000	EE
Project Management				8,505	
Subtotal O&M Costs				60,775	
Contingency (20% of O&M Costs)				12,155	
Total Annual O&M Costs				72,930	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				315,787	
TOTAL PRESENT WORTH COSTS				$1.9 Million	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
UXO - unexploded ordnance

Table V-37
Alternative P2-3 - UXO Clearance in Parcels 2, 3, and 5

	Unit	Quantity	Unit Cost ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Clear and Destroy UXO	Acre	73,436	2,260 - 6,371	166.0 Million - 467.8 Million	EE
Total Direct Capital Costs				**166.0 Million - 467.8 Million**	
INDIRECT CAPITAL COSTS					
Subtotal Indirect Capital Cost					
Contingency (20% Direct and Indirect Capital Costs)					
Total Indirect Capital Costs					
TOTAL CAPITAL COSTS					
ANNUAL OPERATION AND MAINTENANCE COSTS					
Project Management					
Subtotal O&M Costs					
Contingency (20% of O&M Costs)					
Total Annual O&M Costs					
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33					
TOTAL PRESENT WORTH COSTS				$166.0 Million to 467.8 Million	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
UXO - unexploded ordnance

Table V-38
Alternative P2-4 - Surface and Shallow Subsurface UXO Clearance at "Recreational Gateways"

	Unit	Quantity	Unit Cost ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Clear and Destroy UXO	Acre	115	2,260 - 6,371	0.3 Million - 0.75 Million	EE
	Signs	2,904	129	0.37 Million	
Total Direct Capital Costs				**0.7 Million - 1.1 Million**	
INDIRECT CAPITAL COSTS					
Design (3%)	Lump Sum	1		11,238	EE
Construction and Insurance (20%)	Lump Sum	1		74,923	EE
Subtotal Indirect Capital Cost				86,161	
Contingency (20% Direct and Indirect Capital Costs)				91,232	
Total Indirect Capital Costs				177,393	
TOTAL CAPITAL COSTS				0.8 Million - 1.3 Million	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Site Inspection	Site	1		13,468	EE
Site Review	Site	1		1,200	EE
Education	Site	1		5,000	EE
Project Management				2,835	
Subtotal O&M Costs				22,503	
Contingency (20% of O&M Costs)				4,500	
Total Annual O&M Costs				27,003	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				117,000	
TOTAL PRESENT WORTH COSTS				0.96 Million - 1.4 Million	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
UXO - unexploded ordnance

Table V-39
Alternative P3-2 - Institutional Controls for Parcel 4

	Unit	Quantity	Unit Cost ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Signs	6 x 6 signs	929	645	599,205	EE
Fencing	Feet	92,903	29	2,694,187	EE
Total Direct Capital Costs	FT			**3.3 Million**	
INDIRECT CAPITAL COSTS					
Design (3%)	Lump Sum	1		98,802	EE
Construction and Insurance (20%)	Lump Sum	1		658,678	EE
Subtotal Indirect Capital Cost				757,480	
Contingency (20% Direct and Indirect Capital Costs)				810,174	
Total Indirect Capital Costs				1,567,654	
TOTAL CAPITAL COSTS				4.9 Million	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Site Inspection	Site	1		13,468	EE
Site Review	Site	1		1,200	EE
Education	Site	1		5,000	EE
Project Management				2,835	
Subtotal O&M Costs				22,503	
Contingency (20% of O&M Costs)				4,500	
Total Annual O&M Costs				27,004	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				117,000	
TOTAL PRESENT WORTH COSTS				$5.0 Million	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
UXO - unexploded ordnance

Table V-40
Alternative P3-3 - UXO Clearance in Parcel 4

	Unit	Quantity	Unit Cost ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Locate and Destroy UXO	Acre	1,587	4,520 to 4,172,800	7.2 Million to 6,664 Million	EE
Total Direct Capital Costs					
INDIRECT CAPITAL COSTS					
Subtotal Indirect Capital Cost					
Contingency (20% Direct and Indirect Capital Costs)					
Total Indirect Capital Costs					
TOTAL CAPITAL COSTS					
ANNUAL OPERATION AND MAINTENANCE COSTS					
Project Management					
Subtotal O&M Costs					
Contingency (20% of O&M Costs)					
Total Annual O&M Costs					
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33					
TOTAL PRESENT WORTH COSTS				7.2 Million to 6,664 Million	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
UXO - unexploded ordnance

Table V-41

Alternative S2 - Institutional Controls

for Andrew Lake Waste Ordnance Demolition Range (SWMU 1)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs at UXO site	Sign	281	102	28,662	CM
Install fence at UXO site	Linear foot	18,600	29	537,390	CM
Implement access road closures at UXO site	Linear foot	22	57	1,261	CM
Total Direct Capital Costs				567,313	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency (20% Direct and Indirect Capital Costs)				114,463	
Total Indirect Capital Costs				119,463	
TOTAL CAPITAL COSTS				686,775	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual inspection and repair of fences and signs at UXO site	Event	1	5,000	5,000	EE
Monitor Sediment at 3 Locations	Event	1	4,732	4,732	EE
Monitoring Report	Event	1	3,600	3,600	EE
Review UXO clearance technologies	Event	1	500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Annual O&M Costs				15,832	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				68,553	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				42,588	
Contingency (20% of O&M Costs)				22,228	
TOTAL O&M PRESENT WORTH COSTS (30 years)				133,369	
TOTAL PRESENT WORTH COSTS				820,144	

Notes:

CM - cost manual

EE - engineering estimate

FD - former design

O&M - operation and maintenance

O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)

Table V-42

Alternative S2 - Institutional Controls

For Causeway Minefield (SWMU 2)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install fence at SWMU 2 - Minefield	Linear Foot	6,000	29	176,400	CM
Install Signs at SWMU 2 - Minefield	Sign	90	102	9,180	CM
Total Direct Capital Costs				185,580	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at SWMU 2 - Minefield	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency (20% Direct and Indirect Capital Costs)				38,116	
Total Indirect Capital Costs				43,116	
TOTAL CAPITAL COSTS				228,696	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual inspection and repair of fences and signs at SWMU 2- Minefield	Lump Sum	1	5,000	5,000	EE
Review UXO clearance technologies	Lump Sum	0.2	2,500	500	EE
Conduct annual resident seminars	Site	1	2,000	2,000	EE
Annual O&M Costs				7,500	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				32,475	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				20,175	
Contingency (20% of O&M Costs)				10,530	
TOTAL O&M PRESENT WORTH COSTS (30 years)				63,180	
TOTAL PRESENT WORTH COSTS				291,876	

Notes:

CM - cost manual

EE - engineering estimate

FD - former design

O&M - operation and maintenance

O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)

Table V-43

Alternative S2 - Institutional Controls

For Andrew Lake Landfill and Shoreline (SWMU 8 Shoreline)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs at SWMU 8- Shoreline	Sign	78	645	50,310	CM
Implement access road closures SWMU 8- Shoreline	Linear foot	60	64	3,846	CM
Total Direct Capital Costs				54,156	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at SWMU 8 Shoreline- Danger UXO	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency (20% Direct and Indirect Capital Costs)				11,831	
Total Indirect Capital Costs				16,831	
TOTAL CAPITAL COSTS				70,987	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual inspection and repair of fences and signs at SWMU 8- Shoreline	Event	1	5,000	5,000	EE
Review UXO clearance technologies	Event	0.2	2,500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Annual O&M Costs				7,500	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				32,475	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				20,175	
Contingency (20% of O&M Costs)				10,530	
TOTAL O&M PRESENT WORTH COSTS (30 years)				63,180	
TOTAL PRESENT WORTH COSTS				134,167	

Notes:

CM - cost manual

EE - engineering estimate

FD - former design

O&M - operation and maintenance

O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30

RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)

Table V-44
Alternative S2 - Institutional Controls
For Mortar Impact Area (SA 93)

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs at UXO site	Sign	171	568	97,152	CM
Install Fencing at UXO site	Liner foot	11,400	29	326,610	CM
Implement access road closures at UXO site	Liner foot	30	64	1,923	CM
Total Direct Capital Costs				425,685	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency (20% Direct and Indirect Capital Costs)				86,137	
Total Indirect Capital Costs				91,137	
TOTAL CAPITAL COSTS				516,822	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Sediment at 2 Locations	Event	1	4,432	4,432	EE
Monitoring Report	Event	1.0	3,600	3,600	EE
Annual inspection and repair of fences and signs at UXO site	Event	1	5,000	5,000	EE
Review UXO clearance technologies	Event	0.2	2,500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Annual O&M Costs				15,532	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				67,254	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				41,781	
Contingency (20% of O&M Costs)				21,807	
TOTAL O&M PRESENT WORTH COSTS (30 years)				130,842	
TOTAL PRESENT WORTH COSTS				647,664	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30
RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)

Table V-45
Alternative S3 - Removal
for Andrew Lake Waste Ordnance Demolition Range (SWMU 1)
Option: Surface Clearance

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs at UXO site	Sign	281	102	28,662	CM
Install fence at UXO site	Linear foot	18,600	29	537,390	CM
Implement access road closures at UXO site	Linear foot	22	57	1,261	CM
Labor, Materials and Equipment for 3-foot spacing of explosives per 1800-ft leg	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
Confirmation Application - Labor, Materials and Equipment for 3-foot spacing of explosives per 1800-ft leg	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
Accessory Kit for Initiating Line Charge per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
Confirmation Application - Accessory Kit for Initiating Line Charge Per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
Restablish Native Flora (Hydroseeding) for Explosive Breaching Areas	Acre	70	10,890	762,300	FD
Labor - Surface Clearance (Crew)	Acre	890	966	860,180	RA
Materials/ Equipment - Surface Clearance	Acre	890	141	125,460	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	1	187,400	187,400	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	3	20,400	61,200	RA
Per Diem - Surface Clearance (Crew)	Day	74	2,040	150,960	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis Materials)	Event	4	3,825	15,300	EE
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				1,400,500	
Total Direct Capital Costs				136,950,573	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				27,391,115	
Total Indirect Capital Costs				27,396,115	
TOTAL CAPITAL COSTS				164,346,687	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual inspection and repair of fences and signs at UXO site	Event	1	5,000	5,000	EE
Monitor Sediment at 3 Locations	Event	1	4,732	4,732	EE
Monitoring Report	Event	1	3,600	3,600	EE
Review UXO clearance technologies	Event	1	500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Annual O&M Costs				15,832	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				68,553	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				42,588	
Contingency (20% of O&M Costs)				22,228	
TOTAL O&M PRESENT WORTH COSTS (30 years)				133,369	
TOTAL PRESENT WORTH COSTS				164,480,056	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30
RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)
VQ - Vendor Quote (Navy EOD, Dated January 10, 1997)

Table V-45 (continued)
Alternative S3 - Removal
for Andrew Lake Waste Ordnance Demolition Range (SWMU 1)
Option: 1-foot Clearance

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs at UXO site	Sign	281	102	28,662	CM
Install fence at UXO site	Linear foot	18,600	29	537,390	CM
Implement access road closures at UXO site	Linear foot	22	57	1,261	CM
Labor, Materials and Equipment for 3-foot spacing of explosives per 1800-ft leg	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
Confirmation Application - Labor, Materials and Equipment for 3-foot spacing of explosives per 1800-ft leg	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
Accessory Kit for Initiating Line Charge per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
Confirmation Application - Accessory Kit for Initiating Line Charge Per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
Restablish Native Flora (Hydroseeding) for Explosive Breaching Areas	Acre	70	10,890	762,300	FD
Labor - Surface Clearance (Crew)	Acre	890	966	860,180	RA
Materials/ Equipment - Surface Clearance	Acre	890	141	125,460	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	1	187,400	187,400	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	3	20,400	61,200	RA
Per Diem - Surface Clearance (Crew)	Day	74	2,040	150,960	RA
Labor - Geophysical Survey/Data Managment (Crew)	Acre	730	2,595	1,894,350	RA
Material / Equipment - Geophysical Survey/Data Management	Acre	730	328	239,440	RA
Mobilization/demobillization - Geophysical Survey/Data Management	Lump Sum	1	294,400	294,400	RA
Travel - Geophysical Survey/Data Managment (Crew) per 30 days	Trip	3	37,600	112,800	RA
Per Diem - Geophysical Survey/Data Managment (Crew)	Day	91	2,880	262,080	RA
Labor - UXO Clearance to 1-foot Depth (Crew)	Acre	730	2,382	1,738,860	RA
Material / Equipment - UXO Clearance to 1-foot Depth	Acre	730	374	273,020	RA
Mobilization/demobillization - UXO Clearance to 1-foot Depth	Lump Sum	1	144,000	144,000	RA
Travel- UXO Clearance to 1-foot Depth (Crew) per 30 days	Trip	3	101,680	305,040	RA
Per Diem - UXO Clearance to 1-foot Depth (Crew)	Day	74	3,720	275,280	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis, Materials)	Event	8	3,825	30,600	EE
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				6,955,070	
Total Direct Capital Costs				148,059,713	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				29,612,943	
Total Indirect Capital Costs				29,617,943	
TOTAL CAPITAL COSTS				177,677,655	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual inspection and repair of fences and signs at UXO site	Event	1	5,000	5,000	EE
Monitor Sediment at 3 Locations	Event	1	4,732	4,732	EE
Monitoring Report	Event	1	3,600	3,600	EE
Review UXO clearance technologies	Event	1	500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Annual O&M Costs				15,832	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				68,553	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				42,588	
Contingency (20% of O&M Costs)				22,228	
TOTAL O&M PRESENT WORTH COSTS (30 years)				133,369	
TOTAL PRESENT WORTH COSTS				177,811,024	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30
RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)
VQ - Vendor Quote (Navy EOD, Dated January 10, 1997)

Table V-45 (continued)
Alternative S3 - Removal
for Andrew Lake Waste Ordnance Demolition Range (SWMU 1)
Option: 4-feet Clearance

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs at UXO site	Sign	281	102	28,662	CM
Install fence at UXO site	Linear foot	18,600	29	537,390	CM
Implement access road closures at UXO site	Linear foot	22	57	1,261	CM
Labor, Materials and Equipment for 3-foot spacing of explosives per 1800-ft leg	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
Confirmation Application - Labor, Materials and Equipment for 3-foot spacing of explosives per 1800-ft leg	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
Accessory Kit for Initiating Line Charge per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
Confirmation Application - Accessory Kit for Initiating Line Charge Per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
Restablish Native Flora (Hydroseeding) for Explosive Breaching Areas	Acre	70	10,890	762,300	FD
Labor - Surface Clearance (Crew)	Acre	890	966	860,180	RA
Materials/ Equipment - Surface Clearance	Acre	890	141	125,460	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	1	187,400	187,400	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	3	20,400	61,200	RA
Per Diem - Surface Clearance (Crew)	Day	74	2,040	150,960	RA
Labor - Geophysical Survey/Data Managment (Crew)	Acre	730	2,595	1,894,350	RA
Material / Equipment - Geophysical Survey/Data Management	Acre	730	328	239,440	RA
Mobilization/demobillization - Geophysical Survey/Data Management	Lump Sum	1	294,400	294,400	RA
Travel - Geophysical Survey/Data Managment (Crew) per 30 days	Trip	3	37,600	112,800	RA
Per Diem - Geophysical Survey/Data Managment (Crew)	Day	91	2,880	262,080	RA
Labor - UXO Clearance to 4-foot Depth (Crew)	Acre	730	13,233	9,660,331	RA
Material / Equipment - UXO Clearance to 4-foot Depth	Acre	730	1,744	1,273,120	RA
Mobilization/demobillization - UXO Clearance to 4-foot Depth	Lump Sum	1	600,000	600,000	RA
Travel - UXO Clearance to 4-foot Depth (Crew) per 30 days	Trip	15	48,000	720,000	RA
Per Diem - UXO Clearance to 4-foot Depth (Crew)	Day	410	3,720	1,525,200	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis, Materials)	Event	12	3,825	45,900	EE
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				18,012,821	
Total Direct Capital Costs				170,175,214	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				34,036,043	
Total Indirect Capital Costs				34,041,043	
TOTAL CAPITAL COSTS				204,216,257	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual inspection and repair of fences and signs at UXO site	Event	1	5,000	5,000	EE
Monitor Sediment at 3 Locations	Event	1	4,732	4,732	EE
Monitoring Report	Event	1	3,600	3,600	EE
Review UXO clearance technologies	Event	1	500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Annual O&M Costs				15,832	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				68,553	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				42,588	
Contingency (20% of O&M Costs)				22,228	
TOTAL O&M PRESENT WORTH COSTS (30 years)				133,369	
TOTAL PRESENT WORTH COSTS				204,349,626	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30
RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)
VQ - Vendor Quote (Navy EOD, Dated January 10, 1997)

Table V-45 (continued)
Alternative S3 - Removal
for Andrew Lake Waste Ordnance Demolition Range (SWMU 1)
Option: 10-feet Clearance

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs at UXO site	Sign	281	102	28,662	CM
Install fence at UXO site	Linear foot	18,600	29	537,390	CM
Implement access road closures at UXO site	Linear foot	22	57	1,261	CM
Labor, Materials and Equipment for 3-foot spacing of explosives per 1800-ft leg	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
Confirmation Application - Labor, Materials and Equipment for 3-foot spacing of explosives per 1800-ft leg	Leg (1800 ft)	42,000	1,549	65,058,000	VQ
Accessory Kit for Initiating Line Charge per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
Confirmation Application - Accessory Kit for Initiating Line Charge Per 1800 ft leg	Leg (1800 ft)	42,000	32	1,351,980	VQ
Restablish Native Flora (Hydroseeding) for Explosive Breaching Areas	Acre	70	10,890	762,300	FD
Labor - Surface Clearance (Crew)	Acre	890	966	860,180	RA
Materials/ Equipment - Surface Clearance	Acre	890	141	125,460	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	1	187,400	187,400	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	3	20,400	61,200	RA
Per Diem - Surface Clearance (Crew)	Day	74	2,040	150,960	RA
Labor - Geophysical Survey/Data Managment (Crew)	Acre	640	2,595	1,661,345	RA
Material / Equipment - Geophysical Survey/Data Management	Acre	640	328	209,989	RA
Mobilization/demobillization - Geophysical Survey/Data Management	Lump Sum	1	294,400	294,400	RA
Travel - Geophysical Survey/Data Managment (Crew) per 30 days	Trip	3	37,600	112,800	RA
Per Diem - Geophysical Survey/Data Managment (Crew)	Day	91	2,880	262,080	RA
Labor - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew)	Acre	640	489,000	312,960,000	RA
Mobilization/demobillization - UXO Clearance to 1-foot Depth	Lump Sum	1	144,000	144,000	RA
Mobilization/demobillization - UXO Clearance to 10-foot Depth Dig & Screen Method	Lump Sum	1	600,000	600,000	RA
Travel - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew) per 30 days	Trip	195	147,436	28,750,000	RA
Per Diem - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew)	Day	5,815	8,880	51,637,200	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis, Materials)	Event	17	3,825	65,025	EE
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				398,082,039	
Total Direct Capital Costs				930,313,650	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				186,063,730	
Total Indirect Capital Costs				186,068,730	
TOTAL CAPITAL COSTS				1,116,382,380	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual inspection and repair of fences and signs at UXO site	Event	1	5,000	5,000	EE
Monitor Sediment at 3 Locations	Event	1	4,732	4,732	EE
Monitoring Report	Event	1	3,600	3,600	EE
Review UXO clearance technologies	Event	1	500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Annual O&M Costs				15,832	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				68,553	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				42,588	
Contingency (20% of O&M Costs)				22,228	
TOTAL O&M PRESENT WORTH COSTS (30 years)				133,369	
TOTAL PRESENT WORTH COSTS				1,116,515,749	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30
RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)
VQ - Vendor Quote (Navy EOD, Dated January 10, 1997)

Table V-46
Alternative S3 - Removal
For Causeway Minefield (SWMU 2)
Option: All Depths

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install fence at SWMU 2 - Minefield	Linear Foot	6,000	29	176,400	CM
Install Signs at SWMU 2 - Minefield	Sign	90	102	9,180	CM
Labor, Materials and Equipment for 3-foot spacing of explosives per 1800-ft leg	Leg (1800 ft)	27,000	1,549	41,823,000	VQ
Confirmation Application - Labor, Materials and Equipment for 3-foot spacing of explosives per 1800-ft leg	Leg (1800 ft)	27,000	1,549	41,823,000	VQ
Accessory Kit for Initiating Line Charge per 1800 ft leg	Leg (1800 ft)	27,000	32	869,130	VQ
Confirmation Application- Accessory Kit for Initiating Line Charge per 1800 ft leg	Leg (1800 ft)	27,000	32	869,130	VQ
Restablish Native Flora (Hydroseeding) for Explosive Breaching Areas	Acre	45	10,890	490,050	FD
Materials/ Equipment - Surface Clearance	Acre	45	153	6,885	EE
Mobilization/demobillization - Surface Clearance	Lump Sum	0.5	187,400	93,700	EE
Travel- Surface Clearance (Crew) per 30 days	Trip	1	8,160	8,160	EE
Per Diem - Surface Clearance (Crew)	Day	4	9,400	37,600	EE
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				146,345	
Total Direct Capital Costs				86,352,580	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at SWMU 2 - Minefield	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				17,271,516	
Total Indirect Capital Costs				17,276,516	
TOTAL CAPITAL COSTS				103,629,096	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual inspection and repair of fences and signs at SWMU 2- Minefield	Lump Sum	1	5,000	5,000	EE
Review UXO clearance technologies	Lump Sum	0.2	2,500	500	EE
Conduct annual resident seminars	Site	1	2,000	2,000	EE
Annual O&M Costs				7,500	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				32,475	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				20,175	
Contingency (20% of O&M Costs)				10,530	
TOTAL O&M PRESENT WORTH COSTS (30 years)				63,180	
TOTAL PRESENT WORTH COSTS				103,692,276	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30
RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)
VQ - Vendor Quote (Navy EOD, Dated January 10, 1997)

Table V-47
Alternative S3 - Removal
For Andrew Lake Landfill and Shoreline (SWMU 8 Shoreline)
Option: Surface Clearance

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs at SWMU 8- Shoreline	Sign	78	645	50,310	CM
Implement access road closures SWMU 8- Shoreline	Linear foot	60	64	3,846	CM
Labor - Surface Clearance (Crew)	Acre	24	1,049	25,176	RA
Materials/ Equipment - Surface Clearance	Acre	24	153	3,672	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	0.5	187,400	93,700	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
Per Diem - Surface Clearance (Crew)	Day	2	2,040	4,080	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	1	3,825	3,825	EE
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				150,853	
Total Direct Capital Costs				355,862	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at SWMU 8 Shoreline- Danger UXO	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				72,172	
Total Indirect Capital Costs				77,172	
TOTAL CAPITAL COSTS				433,034	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual inspection and repair of fences and signs at SWMU 8- Shoreline	Event	1	5,000	5,000	EE
Review UXO clearance technologies	Event	0.2	2,500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Labor - Surface Clearance (Crew)	Acre	8	1,049	8,392	RA
Annual Periodic Shoreline Surface Clearance - Materials/ Equipment	Acre	8	153	1,224	RA
Annual Periodic Shoreline Surface Clearance - Mobilization/ demobillization	Lump Sum	0.25	188,000	47,000	RA
Annual Periodic Shoreline Surface Clearance- Travel (Crew)	Trip	0.5	20,400	10,200	RA
Annual Periodic Shoreline Surface Clearance Per Diem (Crew)	Day	1	2,040	2,040	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	1	3,825	3,825	EE
Annual O&M Costs				80,181	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				347,184	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				215,687	
Contingency (20% of O&M Costs)				112,574	
TOTAL O&M PRESENT WORTH COSTS (30 years)				675,445	
TOTAL PRESENT WORTH COSTS				1,108,479	

Notes
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30
RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)

Table V-47 (continued)
Alternative S3 - Removal
For Andrew Lake Landfill and Shoreline (SWMU 8 Shoreline)
Option: 1-foot Clearance

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs at SWMU 8- Shoreline	Sign	78	645	50,310	CM
Implement access road closures SWMU 8- Shoreline	Linear foot	60	64	3,846	CM
Labor - Surface Clearance (Crew)	Acre	24	1,049	25,176	RA
Materials/ Equipment - Surface Clearance	Acre	24	153	3,672	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	0.5	187,400	93,700	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
Per Diem - Surface Clearance (Crew)	Day	2	2,040	4,080	RA
Labor - Geophysical Survey/Data Managment (Crew)	Acre	1.3	374	486	RA
Material / Equipment - Geophysical Survey/Data Management	Acre	1.3	328	426	RA
Mobilization/demobillization - Geophysical Survey/Data Management	Lump Sum	1	294,400	147,200	RA
Travel - Geophysical Survey/Data Managment (Crew) per 30 days	Trip	1	37,600	37,600	RA
Per Diem - Geophysical Survey/Data Managment (Crew)	Day	1	2,880	2,880	RA
Labor - UXO Clearance to 1-foot Depth (Crew)	Acre	1.3	2,382	3,097	RA
Material / Equipment - UXO Clearance to 1-foot Depth	Acre	1.3	374	486	RA
Mobilization/demobillization - UXO Clearance to 1-foot Depth	Lump Sum	1	600,000	300,000	RA
Travel- UXO Clearance to 1-foot Depth (Crew) per 30 days	Trip	1	48,000	48,000	RA
Per Diem - UXO Clearance to 1-foot Depth (Crew)	Day	1	3,720	3,720	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	2	3,825	7,650	EE
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				698,573	
Total Direct Capital Costs				1,451,303	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at SWMU 8 Shoreline- Danger UXO	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				291,261	
Total Indirect Capital Costs				296,261	
TOTAL CAPITAL COSTS				1,747,563	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual inspection and repair of fences and signs at SWMU 8- Shoreline	Event	1	5,000	5,000	EE
Review UXO clearance technologies	Event	0.2	2,500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Labor - Surface Clearance (Crew)	Acre	8	1,049	8,392	RA
Annual Periodic Shoreline Surface Clearance - Materials/ Equipment	Acre	8	153	1,224	RA
Annual Periodic Shoreline Surface Clearance - Mobilization/ demobillization	Lump Sum	0.25	188,000	47,000	RA
Annual Periodic Shoreline Surface Clearance- Travel (Crew)	Trip	0.5	20,400	10,200	RA
Annual Periodic Shoreline Surface Clearance Per Diem (Crew)	Day	1	2,040	2,040	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	1	3,825	3,825	EE
Annual O&M Costs				80,181	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				347,184	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				215,687	
Contingency (20% of O&M Costs)				112,574	
TOTAL O&M PRESENT WORTH COSTS (30 years)				675,445	
TOTAL PRESENT WORTH COSTS				2,423,008	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30
RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)

Table V-47 (continued)
Alternative S3 - Removal
For Andrew Lake Landfill and Shoreline (SWMU 8 Shoreline)
Option: 4-foot Clearance

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs at SWMU 8- Shoreline	Sign	78	645	50,310	CM
Implement access road closures SWMU 8- Shoreline	Linear foot	60	64	3,846	CM
Labor - Surface Clearance (Crew)	Acre	24	1,049	25,176	RA
Materials/ Equipment - Surface Clearance	Acre	24	153	3,672	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	0.5	187,400	93,700	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
Per Diem - Surface Clearance (Crew)	Day	2	2,040	4,080	RA
Labor - Geophysical Survey/Data Managment (Crew)	Acre	1.3	374	486	RA
Material / Equipment - Geophysical Survey/Data Management	Acre	1.3	328	426	RA
Mobilization/demobillization - Geophysical Survey/Data Management	Lump Sum	1	294,400	147,200	RA
Travel - Geophysical Survey/Data Managment (Crew) per 30 days	Trip	1	37,600	37,600	RA
Per Diem - Geophysical Survey/Data Managment (Crew)	Day	1	2,880	2,880	RA
Labor - UXO Clearance to 4-foot Depth (Crew)	Acre	1.3	13,233	17,203	RA
Material / Equipment - UXO Clearance to 4-foot Depth	Acre	1.3	1,744	2,267	RA
Mobilization/demobillization - UXO Clearance to 4-foot Depth	Lump Sum	1	600,000	300,000	RA
Travel - UXO Clearance to 4-foot Depth (Crew) per 30 days	Trip	1	48,000	48,000	RA
Per Diem - UXO Clearance to 4-foot Depth (Crew)	Day	1	3,720	3,720	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	3	3,825	11,475	EE
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				718,286	
Total Direct Capital Costs				1,490,728	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at SWMU 8 Shoreline- Danger UXO	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				299,146	
Total Indirect Capital Costs				304,146	
TOTAL CAPITAL COSTS				1,794,874	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual inspection and repair of fences and signs at SWMU 8- Shoreline	Event	1	5,000	5,000	EE
Review UXO clearance technologies	Event	0.2	2,500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Labor - Surface Clearance (Crew)	Acre	8	1,049	8,392	RA
Annual Periodic Shoreline Surface Clearance - Materials/ Equipment	Acre	8	153	1,224	RA
Annual Periodic Shoreline Surface Clearance - Mobilization/ demobillization	Lump Sum	0.25	188,000	47,000	RA
Annual Periodic Shoreline Surface Clearance- Travel (Crew)	Trip	0.5	20,400	10,200	RA
Annual Periodic Shoreline Surface Clearance Per Diem (Crew)	Day	1	2,040	2,040	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	1	3,825	3,825	EE
Annual O&M Costs				80,181	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				347,184	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				215,687	
Contingency (20% of O&M Costs)				112,574	
TOTAL O&M PRESENT WORTH COSTS (30 years)				675,445	
TOTAL PRESENT WORTH COSTS				2,470,319	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30
RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)

Table V-47 (continued)
Alternative S3 - Removal
For Andrew Lake Landfill and Shoreline (SWMU 8 Shoreline)
Option: 10-foot Clearance

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs at SWMU 8- Shoreline	Sign	78	645	50,310	CM
Implement access road closures SWMU 8- Shoreline	Linear foot	60	64	3,846	CM
Labor - Surface Clearance (Crew)	Acre	24	1,049	25,176	RA
Materials/ Equipment - Surface Clearance	Acre	24	153	3,672	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	0.5	187,400	93,700	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
Per Diem - Surface Clearance (Crew)	Day	2	2,040	4,080	RA
Labor - Geophysical Survey/Data Managment (Crew)	Acre	1.3	374	486	RA
Material / Equipment - Geophysical Survey/Data Management	Acre	1.3	328	426	RA
Mobilization/demobillization - Geophysical Survey/Data Management	Lump Sum	1	294,400	147,200	RA
Travel - Geophysical Survey/Data Managment (Crew) per 30 days	Trip	1	37,600	37,600	RA
Per Diem - Geophysical Survey/Data Managment (Crew)	Day	1	2,880	2,880	RA
Labor - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew)	Acre	1.3	489,000	635,700	RA
Material / Equipment - UXO Clearance to 10-foot Depth Dig & Screen Method	Acre	1.3	287,500	373,750	RA
Mobilization/demobillization - UXO Clearance to 10-foot Depth Dig & Screen Method	Lump Sum	1	600,000	300,000	RA
Travel - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew) per 30 days	Trip	1	115,000	115,000	RA
Per Diem - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew)	Day	14	8,880	124,320	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	5	3,825	19,125	EE
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				1,903,516	
Total Direct Capital Costs				3,861,187	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at SWMU 8 Shoreline- Danger UXO	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				773,237	
Total Indirect Capital Costs				778,237	
TOTAL CAPITAL COSTS				4,639,425	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Annual inspection and repair of fences and signs at SWMU 8- Shoreline	Event	1	5,000	5,000	EE
Review UXO clearance technologies	Event	0.2	2,500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Labor - Surface Clearance (Crew)	Acre	8	1,049	8,392	RA
Annual Periodic Shoreline Surface Clearance - Materials/ Equipment	Acre	8	153	1,224	RA
Annual Periodic Shoreline Surface Clearance -Mobilization/ demobilization	Lump Sum	0.25	188,000	47,000	RA
Annual Periodic Shoreline Surface Clearance- Travel (Crew)	Trip	0.5	20,400	10,200	RA
Annual Periodic Shoreline Surface Clearance Per Diem (Crew)	Day	1	2,040	2,040	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	1	3,825	3,825	EE
Annual O&M Costs				80,181	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				347,184	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				215,687	
Contingency (20% of O&M Costs)				112,574	
TOTAL O&M PRESENT WORTH COSTS (30 years)				675,445	
TOTAL PRESENT WORTH COSTS				5,314,869	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30
RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)

Table V-48					
Alternative S3 - Removal					
For Mortar Impact Area (SA 93)					
Option: Surface Clearance					
	Unit	**Quantity**	**Unit Costs ($)**	**Costs ($)**	**Source**
DIRECT CAPITAL COSTS					
Install signs at UXO site	Sign	171	568	97,152	CM
Install Fencing at UXO site	Liner foot	11,400	29	326,610	CM
Implement access road closures at UXO site	Liner foot	30	64	1,923	CM
Labor - Surface Clearance (Crew)	Acre	380	1,049	398,620	RA
Materials/ Equipment - Surface Clearance	Lump Sum	380	153	58,140	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	1	187,400	187,400	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
Per Diem - Surface Clearance (Crew)	Day	32	2,040	65,280	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	2	3,825	7,650	EE
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				739,413	
Total Direct Capital Costs				1,902,588	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				381,518	
Total Indirect Capital Costs				386,518	
TOTAL CAPITAL COSTS				2,289,106	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Sediment at 2 Locations	Event	1	4,432	4,432	EE
Monitoring Report	Event	1	3,600	3,600	EE
Annual inspection and repair of fences and signs at UXO site	Event	1	5,000	5,000	EE
Review UXO clearance technologies	Event	0.2	2,500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Annual O&M Costs				15,532	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				67,254	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				41,781	
Contingency (20% of O&M Costs)				21,807	
TOTAL O&M PRESENT WORTH COSTS (30 years)				130,842	
TOTAL PRESENT WORTH COSTS				2,419,947	
Notes:					
CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30					
RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)					

Table V-48 (continued)					
Alternative S3 - Removal					
For Mortar Impact Area (SA 93)					
Option: 1-foot Clearance					
	Unit	**Quantity**	**Unit Costs ($)**	**Costs ($)**	**Source**
DIRECT CAPITAL COSTS					
Install signs at UXO site	Sign	171	568	97,152	CM
Install Fencing at UXO site	Liner foot	11,400	29	326,610	CM
Implement access road closures at UXO site	Liner foot	30	64	1,923	CM
Labor - Surface Clearance (Crew)	Acre	380	1,049	398,620	RA
Materials/ Equipment - Surface Clearance	Lump Sum	380	153	58,140	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	1	187,400	187,400	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
Per Diem - Surface Clearance (Crew)	Day	1	2,040	2,040	RA
Labor - Geophysical Survey/Data Managment (Crew)	Acre	380	2,595	986,100	RA
Material / Equipment - Geophysical Survey/Data Management	Acre	380	328	124,640	RA
Mobilization/demobillization - Geophysical Survey/Data Management	Lump Sum	1	294,400	294,400	RA
Travel - Geophysical Survey/Data Managment (Crew) per 30 days	Trip	2	37,600	75,200	RA
Per Diem - Geophysical Survey/Data Managment (Crew)	Day	48	2,880	138,240	RA
Labor - UXO Clearance to 1-foot Depth (Crew)	Acre	380	2,382	905,160	RA
Material / Equipment - UXO Clearance to 1-foot Depth	Acre	380	374	142,120	RA
Mobilization/demobillization - UXO Clearance to 1-foot Depth	Lump Sum	1	600,000	600,000	RA
Travel- UXO Clearance to 1-foot Depth (Crew) per 30 days	Trip	2	48,000	96,000	RA
Per Diem - UXO Clearance to 1-foot Depth (Crew)	Day	38	3,720	141,360	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	4	3,825	15,300	EE
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				4,187,043	
Total Direct Capital Costs				8,797,848	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				1,760,570	
Total Indirect Capital Costs				1,765,570	
TOTAL CAPITAL COSTS				10,563,418	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Sediment at 2 Locations	Event	1	4,432	4,432	EE
Monitoring Report	Event	1	3,600	3,600	EE
Annual inspection and repair of fences and signs at UXO site	Event	1	5,000	5,000	EE
Review UXO clearance technologies	Event	0.2	2,500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Annual O&M Costs				15,532	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				67,254	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				41,781	
Contingency (20% of O&M Costs)				21,807	
TOTAL O&M PRESENT WORTH COSTS (30 years)				130,842	
TOTAL PRESENT WORTH COSTS				10,694,259	
Notes:					
CM - cost manual					
EE - engineering estimate					
FD - former design					
O&M - operation and maintenance					
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30					
RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)					

Table V-48 (continued)
Alternative S3 - Removal
For Mortar Impact Area (SA 93)
Option: 4-foot Clearance

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs at UXO site	Sign	171	568	97,152	CM
Install Fencing at UXO site	Liner foot	11,400	29	326,610	CM
Implement access road closures at UXO site	Liner foot	30	64	1,923	CM
Labor - Surface Clearance (Crew)	Acre	380	1,049	398,620	RA
Materials/ Equipment - Surface Clearance	Lump Sum	380	153	58,140	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	1	187,400	187,400	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
Per Diem - Surface Clearance (Crew)	Day	32	2,040	65,280	RA
Labor - Geophysical Survey/Data Managment (Crew)	Acre	380	2,595	986,100	RA
Material / Equipment - Geophysical Survey/Data Management	Acre	380	328	124,640	RA
Mobilization/demobillization - Geophysical Survey/Data Management	Lump Sum	1	294,400	294,400	RA
Travel - Geophysical Survey/Data Managment (Crew) per 30 days	Trip	2	37,600	75,200	RA
Per Diem - Geophysical Survey/Data Managment (Crew)	Day	48	2,880	138,240	RA
Labor - UXO Clearance to 4-foot Depth (Crew)	Acre	380	13,233	5,028,665	RA
Material / Equipment - UXO Clearance to 4-foot Depth	Acre	380	1,744	662,720	RA
Mobilization/demobillization - UXO Clearance to 4-foot Depth	Lump Sum	1	600,000	600,000	RA
Travel - UXO Clearance to 4-foot Depth (Crew) per 30 days	Trip	7	48,000	336,000	RA
Per Diem - UXO Clearance to 4-foot Depth (Crew)	Day	211	3,720	784,920	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis, Materials)	Event	6	3,825	22,950	EE
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				9,785,598	
Total Direct Capital Costs				19,994,959	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				3,999,992	
Total Indirect Capital Costs				4,004,992	
TOTAL CAPITAL COSTS				23,999,951	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Sediment at 2 Locations	Event	1	4,432	4,432	EE
Monitoring Report	Event	1	3,600	3,600	EE
Annual inspection and repair of fences and signs at UXO site	Event	1	5,000	5,000	EE
Review UXO clearance technologies	Event	0.2	2,500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Annual O&M Costs				15,532	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				67,254	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				41,781	
Contingency (20% of O&M Costs)				21,807	
TOTAL O&M PRESENT WORTH COSTS (30 years)				130,842	
TOTAL PRESENT WORTH COSTS				24,130,792	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30
RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)

Table V-48 (continued)
Alternative S3 - Removal
For Mortar Impact Area (SA 93)
Option: 10-foot Clearance

	Unit	Quantity	Unit Costs ($)	Costs ($)	Source
DIRECT CAPITAL COSTS					
Install signs at UXO site	Sign	171	568	97,152	CM
Install Fencing at UXO site	Liner foot	11,400	29	326,610	CM
Implement access road closures at UXO site	Liner foot	30	64	1,923	CM
Labor - Surface Clearance (Crew)	Acre	380	1,049	398,620	RA
Materials/ Equipment - Surface Clearance	Lump Sum	380	153	58,140	RA
Mobilization/demobillization - Surface Clearance	Lump Sum	1	187,400	187,400	RA
Travel- Surface Clearance (Crew) per 30 days	Trip	1	20,400	20,400	RA
Per Diem - Surface Clearance (Crew)	Day	32	2,040	65,280	RA
Labor - Geophysical Survey/Data Managment (Crew)	Acre	320	2,595	830,296	RA
Material / Equipment - Geophysical Survey/Data Management	Acre	320	328	104,947	RA
Mobilization/demobillization - Geophysical Survey/Data Management	Lump Sum	1	294,400	294,400	RA
Travel - Geophysical Survey/Data Managment (Crew) per 30 days	Trip	2	37,600	75,200	RA
Per Diem - Geophysical Survey/Data Managment (Crew)	Day	48	2,880	138,240	RA
Labor - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew)	Acre	320	489,000	156,480,000	RA
Material / Equipment - UXO Clearance to 10-foot Depth Dig & Screen Method	Acre	320	287,500	92,000,000	RA
Mobilization/demobillization - UXO Clearance to 10-foot Depth Dig & Screen Method	Lump Sum	1	600,000	600,000	RA
Travel - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew) per 30 days	Trip	95	115,000	10,925,000	RA
Per Diem - UXO Clearance to 10-foot Depth Dig & Screen Method (Crew)	Day	2,902	8,880	25,769,760	RA
Detonation of Cleared Explosives & Post Detonation Sampling per 50 Acres Cleared (Labor, Analysis. Materials)	Event	8	3,825	30,600	EE
Contingency - 100% Direct Capital Costs Associated with UXO Removal Action				287,980,206	
Total Direct Capital Costs				576,384,174	
INDIRECT CAPITAL COSTS					
Apply landuse restrictions at UXO site (Military Reserve Only)	Site	1	5,000	5,000	EE
Subtotal Indirect Capital Cost				5,000	
Contingency - (20% Direct and Indirect Capital Costs)				115,277,835	
Total Indirect Capital Costs				115,282,835	
TOTAL CAPITAL COSTS				691,667,009	
ANNUAL OPERATION AND MAINTENANCE COSTS					
Monitor Sediment at 2 Locations	Event	1	4,432	4,432	EE
Monitoring Report	Event	1	3,600	3,600	EE
Annual inspection and repair of fences and signs at UXO site	Event	1	5,000	5,000	EE
Review UXO clearance technologies	Event	0.2	2,500	500	EE
Conduct annual resident seminars	Event	1	2,000	2,000	EE
Annual O&M Costs				15,532	
Present Worth Annual O&M Costs (5 years, 5%) - Factor = 4.33				67,254	
Present Worth Annual O&M Costs (25 years, 25% per 5 year interval) - Factor = 2.69				41,781	
Contingency (20% of O&M Costs)				21,807	
TOTAL O&M PRESENT WORTH COSTS (30 years)				130,842	
TOTAL PRESENT WORTH COSTS				691,797,851	

Notes:
CM - cost manual
EE - engineering estimate
FD - former design
O&M - operation and maintenance
O&M costs distributed annually for years 0 to 5, every 5 years for years 6 to 30
RA- Actual removal action (Adak UXO Clearance Estimate, Dated August 11, 1997)

Table V-49

Summary of Costs by Remedial Alternative for UXO Sites

Remedial Alternative	Capital ($)	Annual O&M ($)	Total Present Worth Cost ($)
Alternative 1 - No Action			
All UXO Sites	0	0	0
Alternative S2 - Institutional Controls			
SWMU 1	687,000	16,000	820,000
SWMU 2	229,000	7,500	292,000
SWMU 8	71,000	7,500	134,000
SA 93	517,000	16,000	648,000
Alternative S3 - Removal Option: Surface Clearance			
SWMU 1	164,347,000	16,000	164,480,000
SWMU 2	103,629,000	7,500	103,692,000
SWMU 8	433,000	80,000	1,108,000
SA 93	2,289,000	16,000	2,420,000
Alternative S3 - Removal Option: 1-foot Clearance			
SWMU 1	177,678,000	16,000	177,811,000
SWMU 2	103,629,000	7,500	103,692,000
SWMU 8	1,748,000	80,000	2,423,000
SA 93	10,563,000	16,000	10,694,000
Alternative S3 - Removal Option: 4-feet Clearance			
SWMU 1	204,216,000	16,000	204,350,000
SWMU 2	103,629,000	7,500	103,692,000
SWMU 8	1,795,000	80,000	2,470,000
SA 93	24,000,000	16,000	24,131,000
Alternative S3 - Removal Option: 10-feet Clearance			
SWMU 1	1,116,382,000	16,000	1,116,516,000
SWMU 2	103,629,000	7,500	103,692,000
SWMU 8	4,639,000	80,000	5,315,000
SA 93	691,667,000	16,000	691,798,000

NOTES:

UXO Sites:

SWMU 1	Andrew Lake Waste Ordnance Demolition Range
SWMU 2	Causeway Minefield
SWMU 8	Andrew Lake Landfill and Shoreline
SA 93	Mortar Impact Area
O & M	Operation and Maintenance
	Operation and maintenance costs distributed annually for years 0 to 5, and every 5 years for years 6 to 30

Table V-50
Affected Surface Areas by UXO Remedial Alternative

Remedial Alternative and Clearance Option	Affected Surface Area (Acres)			
	SWMU 1	SWMU 2	SWMU 8	SA 93
Alternative S2 - Institutional Controls	890	45	25.3	380
Alternative S3 - Removal Option: Surface Clearance				
Explosive Breaching (Acres)	70	45	-	-
Surface Clearance (Acres)	890	45	24	380
Alternative S3 - Removal Option: 1-foot Clearance				
Explosive Breaching (Acres)	70	45	-	-
Surface Clearance (Acres)	890	45	24	380
Geophysical Survey/Data Management (Acres)	730	-	1.3	380
1-foot Clearance (Acres)	730	-	1.3	380
Alternative S3 - Removal Option: 4-feet Clearance				
Explosive Breaching (Acres)	70	45	-	-
Surface Clearance (Acres)	890	45	24	380
Geophysical Survey/Data Management (Acres)	730	-	1.3	380
4-foot Clearance (Acres)	730	-	1.3	380
Alternative S3 - Removal Option: 10-feet Clearance				
Explosive Breaching (Acres)	70	45	-	-
Surface Clearance (Acres)	890	45	24	380
Geophysical Survey/Data Management (Acres)	640	-	1.3	320
10-foot Clearance (Acres)	640	-	1.3	320

NOTES:

UXO Sites

SWMU 1	Andrew Lake Waste Ordnance Demolition Range
SWMU 2	Causeway Minefield
SWMU 8	Andrew Lake Landfill and Shoreline
SA 93	Mortar Impact Area

Table V-51
Affected Surface Areas and Costs by UXO Remedial Alternative

Remedial Alternative and Clearance Option	Affected Surface Area (Acres)				
	SWMU 1	SWMU 2	SWMU 8	SA 93	All UXO Sites
Alternative S2 - Institutional Controls	890	45	25.3	380	1340.3
Total Present Worth Cost ($):	$820,000	$292,000	$134,000	$648,000	$1,894,000
Alternative S3 - Removal					
Option: Surface Clearance					
Explosive Breaching (Acres)	70	45	-	-	115
Surface Clearance (Acres)	890	45	24	380	1,339
Total Present Worth Cost ($):	$164,480,000	$103,692,000	$1,108,000	$2,420,000	$271,700,000
Alternative S3 - Removal					
Option: 1-foot Clearance					
Explosive Breaching (Acres)	70	45	-	-	115
Surface Clearance (Acres)	890	45	24	380	1,339
Geophysical Survey/Data Management (Acres)	730	-	1.3	380	1,111
1-foot Clearance (Acres)	730	-	1.3	380	1,111
Total Present Worth Cost ($):	$177,811,000	$103,692,000	$2,423,000	$10,694,000	$294,620,000
Alternative S3 - Removal					
Option: 4-feet Clearance					
Explosive Breaching (Acres)	70	45	-	-	115
Surface Clearance (Acres)	890	45	24	380	1,339
Geophysical Survey/Data Management (Acres)	730	-	1.3	380	1,111
4-foot Clearance (Acres)	730	-	1.3	380	1,111
Total Present Worth Cost ($):	$204,350,000	$103,692,000	$2,470,000	$24,131,000	$334,643,000
Alternative S3 - Removal					
Option: 10-feet Clearance					
Explosive Breaching (Acres)	70	45	-	-	115
Surface Clearance (Acres)	890	45	24	380	1,339
Geophysical Survey/Data Management (Acres)	640	-	1.3	320	961
10-foot Clearance (Acres)	640	-	1.3	320	961
Total Present Worth Cost ($):	$1,116,516,000	$103,692,000	$5,315,000	$691,798,000	$1,917,321,000

NOTES:

UXO Sites:

SWMU 1	Andrew Lake Waste Ordnance Demolition Range
SWMU 2	Causeway Minefield
SWMU 8	Andrew Lake Landfill and Shoreline at SWMU 8
SA 93	Mortar Impact Area